

Telephone: 805-934-8200

November 17, 2014

Jared Blumenfeld U. S. EPA, Region 9 Attn: ENF4-1, NPDES/DMR 75 Hawthorne Street San Francisco, CA 94105-3901

Re: Discharge Monitoring Report - Platform Hermosa NPDES Permit CAG280000

Dear Mr. Blumenfeld:

This letter and its attachments represent the Discharge Monitoring Report (DMR) for the months of August, September, and October 2014 for Platform Hermosa.

Included herein are the following attachments:

Attachment 1 is comprised of the EPA DMR forms 3320-1.

Attachment 2 is a listing of the chemical inventory for miscellaneous discharges (specifically non-contact cooling and fire water) as required by II.F. of the subject permit.

Attachment 3 are the undissociated sulfide conversion calculation tables in accordance with II.B.1.a. of the permit.

Attachment 4 provides required pre-dilution and post-dilution chlorine results for non-contact cooling and fire water discharges in accordance with Appendix C of the permit.

Attachment 5 summarizes miscellaneous sampling results for extra testing we initiated. These results are included since the results were derived by an EPA approved test method, in accordance with Part III.D. of the permit.

Attachment 6 includes copies of the official state certified lab reports for O & G and miscellaneous NPDES monitoring. Also included are the laboratory quality control reports for the lab reports, Chronic Whole Effluent Toxicity (WET) Testing performed in

Mr. Blumenfeld November 17, 2014 Page 2 of 3

August on red abalone, giant kelp, and topsmelt and other required information (MLs, MDLs, EPA Methods, chains-of-custody, sample dates, etc.).

Attachment 7 includes a copy of a letter previously sent to EPA.

The following is a brief summary of some of the monitoring and reporting parameters affecting the various discharges

Produced Water (Discharge 002):

A dilution ratio of 2148:1 was derived using the average flow rate from the previous quarter, as defined in Part V of the permit. This dilution was applied to the quarterly testing results and the numeric values reported in the DMR are post dilution values for comparison to the permit limits listed in the permit under Appendix B.

Due to an upset in the produced water system on September 18, 2014, an oil and grease sample received a lab value of 64 mg/l which exceeds the Daily Maximum Limit of 42 mg/l. The monthly average for September was within the permit limits, and there were no O & G exceedances during the months of August and October. It has been concluded that no endangerment to health or the environment was associated with the above occurrence.

Well Treatment, Completion and Workover Fluids (Discharge 003):

There were no well treatment, completion and workover fluid jobs performed during this quarter.

Non-Contact Cooling Water and Fire Water (Discharge 008 and 009):

Small amounts of chlorine are used to prevent internal bio-fouling within the piping in the non-contact cooling water and fire water systems on the platform. Attachment 4 summarizes the official quarterly chlorine result including post dilution and end of pipe results.

The quarterly testing results and the numeric values for chlorine reported in the DMR are post dilution values for comparison to the permit limits listed in Appendix C of the NPDES permit.

The majority of the fire water that is discharged occurs during short fire water pump tests. Separate EPA Plumes UM dilution models were run on the fire water and the non-contact cooling water systems and have been applied to the post dilution values reported in the DMR.

Mr. Blumenfeld November 17, 2014 Page 3 of 3

FM O&G uses an independent contractor to collect NPDES compliance monitoring samples at our offshore platforms. EPA protocols for sampling, preservation and documentation are strict requirements of our monitoring program.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. See 18 U.S.C & 1001 and 33 U.S.C. & 1319. (Penalties under these statutes may include fines up to \$10,000 and or maximum imprisonment of between 6 months and 5 years)

If you should have any questions or require additional information, please contact me at (805) 934-8220.

Sincerely.

David Rose

Manager, Environmental, Health & Safety

Attachment(s)

CC:

Regional Supervisor, Bureau of Ocean Energy Management Alison Dettmer, California Coastal Commission Regional Supervisor, Bureau of Safety Environmental Enforcement Platform Hermosa Foremen

Platform Hermosa

Attachment 1

EPA DMR PERMIT NO. CAG280000

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (PPDES) WELL DISCHARGE MONITORING REPORT (Well DMR)

No Discharge

X

CAG280000 PERMIT NO.

001 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

		MONITORII	NG PERIO	DD		DRILLING FLUIDS AND DRILL CUTTINGS (001)
YR	MO	DAY	YR	MO	DAY	
From:		14 08 01	To:		14 10 31	

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Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

MATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (MPDES)
WELL DISCHARGE MONITORING REPORT (Well DMR)

No Discharge

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CAG280000 PERMIT NO.

001 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD
YR MO DAY YR MO DAY
From: 14 08 01 To: 14 10 31

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¹ Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

NATIONAL POLLUTANT DISCHARGE BLIMINATION SYSTEM (NPDES) WELL DISCHARGE MONITORING REPORT (Well DMR)

No Discharge

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CAG280000 PERMIT NO.

001 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

| MONITORING PERIOD | YR MO DAY | YR MO DAY | From: 14 08 01 | To: 14 10 31

NOTE: Read instructions before completing this form.

DRILLING FLUIDS AND DRILL CUTTINGS (001)

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	Requirement				LC50 > 3% SPP			Footage	Grab
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PROHIBITED DISCHARGE				-86 - 866					
1. Oil-based Fluids					N/A			N/A	
2. Diesel Oil				ľ	""	7			
3. Non-aqueous based drilling fluids	or cuttings				No Discharge			N/A	
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COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

N / A: No discharge of drilling fluids

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (IMPDES)
DISCHARGE MONITORING REPORT (DMR)

No	Dis	ch	ar	gе	
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CAG280000 PERMIT NO. 002 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD												
YR MO DAY	YR MO DAY											
From: 14 08 01	To: 14 10 31											

PRODUCED WATER (002)

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PRODUCED WATER	Sample			Monthly						†	
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	Permit			bbl/Day				┪	-	17day	Louinad
August	Requirement							1		1/day	Estimate
	Sample			Monthly	Î –			†			
	Measurement	27,851		Average					0	1/day	Estimate
	Permit			bbl/Day			**	7			
September	Requirement							<u> </u>		1/day	Estimate
İ	Sample	40.004		Monthly						.	
	Measurement	42,991		Average				4	0	1/day	Estimate
October	Permit Requirement		1	bbl/Day						4/4	
QUARTERLY AVERAGE	requirement		 	0	<u> </u>			 	_	1/day	Estimate
Volume		37,036		Quarterly Average				1	0	1/2000000	Cationat
Volume		37,030	 	bbl/Day	<u> </u>			-	<u> </u>	1/quarter	Estimate
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COMMENT AND EXPLANATION O	F ANY VIOLATION	(Reference a	il attachments	here.)							

¹ Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR)

CAG280000 PERMIT NO. 002 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD										
YR M	O DAY	YR MO	DAY							
From:	14 08 01	To:	14 10 31							

PRODUCED WATER (002) Enforceable Limits

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PARAMETER		Quantity or Loading				Quality or Co	oncentration		NO. EX.		Sample Type
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PRODUCED WATER	Sample				**************************************						
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August	Requirement					29.0	42.0	11.3/-		1/week	Compos
	Sample							<u> </u>		- I/WOOK	Compos
	Measurement					23.6	64.0	1	1*	1/week	Grab
	Permit							mg/L	\vdash		Grab
September	Requirement					29.0	42.0			1/week	Compos
	Sample										
	Measurement					9.1	13.0		0	1/week	Grab
	Permit							mg/L			Grab/
October	Requirement					29.0	42.0		L	1/week	Compos
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David Rose			HER AND EVALUATE THE INFO				-	J	- 1		
Manager, Environmental, Health and Safety		PERSON OR PERSONS WHO	MAHADE THE SYSTEM, OR THE			7	0	(805) 934	-8220	11 17	2014
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		VIOLATIONS. SEE 18 U.S.C. 4	1901 AND 33 LLB,C, & 1319, PE	HALTIES WHOER THESE ST	ATLITES MAY INCLUDE FINES	Signature of PRINCIPAL EXECUTIVE Area		Area	MONTH/DAY/YEA		AY/YEAR
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^{*}Refer to cover letter.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR)

No Discharge

9	CAG28	0000
Ŀ	PERMIT	NO.

002 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA LOCATION: 34º 27' 15"N, 120º 38' 48"W

	MC	NITOR	ING PE	RIOD		
YR	MO	DAY	YR	MO	DAY	
Fro	m: 14	08 01		To: 14	10 31	

PRODUCED WATER (002) **Enforceable Limits**

NOTE: Read instructions before completing this form

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PARAMETER		5:	Quantity or			Quality	or Concentration	n .	NO. EX.	Frequency Analysis	Sample Type	
		Average	Maximum	Units	Minimum	Average ₁	Maximum ₁	Units		1		
PRODUCED WATER MONTHLY 1	Sample											
August	Measurement	1				0.0040	0.0040	mg/L	0	1 / month	Grab	
	Permit										 	
UNDISSOCIATED SULFIDE	Requirement					0.0049	0.00577			1 / month	Grab	
	Sample							Ĭ ·				
September	Measurement					0.0033	0.0033	mg/L	0	1 / month	Grab	
UNDISSOCIATED SULFIDE	Permit					0.0040	0.00577			4 /		
UNDISSUCIATED SULFIDE	Requirement Sample	-				0.0049	0.00577		1	1 / month	Grab	
October	Measurement	ľ				0.0045	0.0045	mg/L	0	1 / month	Grab	
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UNDISSOCIATED SULFIDE	Requirement					0.0049	0.00577			1 / month	Grab	
PRODUCED WATER	Sample											
CONSTITUENTS-QUARTERLY	Measurement					PA	SS	ĺ	0	1/quarter	Composite	
	Permit								f			
3-SPECIES TOXICITY PRODUCED WATER	Requirement				ļ	Pass	/ Fail			1/quarter	Composite	
	Sample				l	1100100				0.4	۱	
CONSTITUENTS 1,2	Measurement Permit				<u> </u>	NODI(B)	NODI(B)	mg/L	0	2 / year	Grab	
COPPER	Requirement		72 1153	*** ***	70 W 126 · B	N/A	N/A			1 / year	Grab	
COFFER	Sample					I IV/A	IN/A			17 year	Grab	
	Measurement					0.00042	0.00042	mg/L	0	2 / year	Grab	
	Permit				·							
BENZENE	Requirement					N/A	N/A			1 / year	Grab	
						NODI(B)	NODI(B)	mg/L	0	2 / year	Grab	
BENZO(A)ANTHRACENE						N/A	N/A		Ţ	1 / year	Grab	
NAME/TITLE PRINCIPAL EXECUTIVE OFFIC	ER	CERTIFY UNDER PENALTY OF LAW	THAT THE DOCUMENT AND	ALL ATTACHMENTE WERE	E PROPAROD LINDON MY			TELEPH	ONE	DAT	Έ	
		DIRECTION OR SUPERVISION IN AC	CORDANCE WITH A SYSTEM O	ESIGNED TO ASSURE TH	MT OLINLIFED							
David Rose		PERSONNEL PROPERLY GATHER	AND EASTERING AND BACKETS.	TION SUBMITTED, BASED	ON MY BIQUIRY OF THE	1	00	(805) 934		11 17	2014	
Manager, Environmental, Health and Sa	siety	PERSON OR PERSONS WHO MAN	AGE THE SYSTEM, OR THOSE	PERSONS DIRECTLY RES	PONSBLE POR	1 Jan	f Reac	(805) 934	-0220	11 17	2014	
		MATERIANG THE PROPERTION, TH	E HE-CHINA HUN HUMMITTED II MIN STIE, I AM AMARIS PARTY	s, 10 (NE DEST OF MY X)	MUMILEUGE AND			-				
		SUBSTITUTE FALSE DEGRAPHE		A LORE WID PROGRAMM	DIT FOR INCHANG							
		VIOLATIONS. SEE 18 LLS.C. & 1001	AND 30 U.S.C. & 1315, P(DIAL)	NES UNDER THESE STAT	TUTES MAY INCLUDE FINES	Signature of PRIN	ICIPAL EXECUTIVE	Area		MONTH/DA	YYEAR	
TYPED OR PRINTED		UP TO STACKED AND OR MAXIMUM IN				7	HORIZED AGENT		Number			
COMMENT AND EXPLANATION OF	ANIVAVIOLATION	(Deference all a	Maahaaata b	\								

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

N / A: There are no limits in the Permit, Appendix B.

NODI(B): below MDL (laboratory's minimum detection level), the maximum value of all analytical results is less than the laboratory's MDLs.

NODI(Q): equal to or above the MDL, but less than the ML or PQL. EPA Form 3320-1 (Rev.9-88) Previous editions may be used.

¹ Results are post-dilution.

² The samples were taken in September following a BSEE sampling event.

NATIONAL POLLUTANT DISCHARGE BLIMINATION SYSTEM (MPDES) DISCHARGE MONITORING REPORT (DMR)

No Discharge
No Discharge

CAG280000 PERMIT NO.

002 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORI	NG PERI	OD		
YR MO DAY	YR	MO	DAY	
From: 14 08 01		To:	14 10 31	

PRODUCED WATER (002) Enforceable Limits

	1							NOTE: Read			
PARAMETER			Quantity of	r Loading		Quality o	r Concentration	ON .	NO. EX.	Frequency Analysis	Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units	┨ ̄```	Allalysis	Type
PRODUCED WATER	Sample								1	-	<u> </u>
CONSTITUENTS _{1,2}	Measurement					NODI(B)	NODI(B)	mg/L	0	2 / year	Grab
, -	Permit			1		1	.1051(5)	19/-	<u> </u>	27,500	Glab
BENZO(A)PYRENE	Requirement					N/A	N/A			1 / уеаг	Grab
	Sample	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							\vdash		
	Measurement					NODI(B)	NODI(B)	mg/L	0	2 / year	Grab
OURVARUE	Permit	i I									
CHRYSENE	Requirement					N/A	N/A			1 / year	Grab
	Sample Measurement			İ]	110010		l	1 .		
	Permit	-		<u> </u>		NODI(B)	NODI(B)	mg/L	0	2 / year	Grab
BENZO(B)FLUORANTHENE	Requirement					N/A	N/A	Ì		1 / year	Grab
DENEO(D) LOOK NATIVENE	Sample				 	17/2	N/A		 	17 year	Grab
	Measurement			ļ		NODI(B)	NODI(B)	mg/L	1 0 1	2 / year	Grab
	Permit		_			11001(0)	NODI(D)	g/		Z / your	Grau
BENZO(K)FLUORANTHENE	Requirement				<u> </u>	N/A	N/A			1 / year	Grab
	I .	}		- (6000) (6		++1 ±					
										-	
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		I CERTIFY UNDER PENALTY OF L	ANY THAT THE DOCUMENT AND	ALL ATTACHMENTS WERE	PREPARED UNDER MY			TELEPH	IONE	DAT	Ē
David Rose Manager, Environmental, Health and Sa		PERSONAL PROPERLY GATHE	NOCORDANCE WITH A SYSTEM S R AND EVALUATE THE INFORMA	TION SUBMITTED. BASED O	H MY PIQUITY OF THE	1) au	fRe	- /90E\ 024	1 9220	11 17	2014
vialiayet, Eliviloitilentai, Healti and Sa	- 1	PERSON OR PERSONS WHO MY CATHERING THE REPORTMATION, THELES THESE ACTURATE AND C	THE EMPORMATION SUBMITTED I	S, TO THE BEST OF MY KW			7	C (605) 834	-0220	11 17 (2014
		SUBMITTING FALSE RECOMMEND	DOMPLETE, I AM ANNAME THAT T IN INCLUDING THE POSSIBLITY O	PETE AND BURNISHMEN	MILIER POR	ļ			$\overline{}$		
	-	VIOLATIONS, SEE 19 LLS.C. & 10	01 AND 33 U.S.C. & 1315, PENAL	THE GOOD THESE STATE	TES MAY INCLUDE FINES	Signature of PRINC	IPAL EXECUTIVE	Area	İ	MONTH/DAY	//YEAR
TYPED OR PRINTED		UP TO \$16,000 AND OR MANAGE				OFFICER or AUTH			Numbe		

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

NODI(B): below MDL (laboratory's minimum detection level), if the maximum value of all analytical results is less than the laboratory's MDLs.

NOD!(Q): equal to or above the MDL, but less than the ML or PQL.

EPA Form 3320-1 (Rev.9-88) Previous editions may be used.

(Replaces EPS Form T-40 which may not be used.)

File:DMR002.xls

Pg 7 of 19

¹ Results are post-dilution.

N / A: There are no limits in the Permit, Appendix B.

² The samples were taken in September following a BSEE sampling event.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (IMPOES)
DISCHARGE MONITORING REPORT (DMR)

No Discharge

Х

CAG280000 PERMIT NO.

003 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

 WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS (003) (Injected or commingled with produced water)

NOTE: Read instructions before completing this form.

PARAMETER			Quantity or Load	ling		Quality or Co	oncentration	140 1 21 1 1000 PA	NO. EX.	Frequency Analysis	Sample Type
	i=	Average	Maximum	Units	Minimum	Average	Maximum	Units	1		',,,,,,
WELL TREATMENT, COMPLETION AND WORKOVER FLUIDS	Sample Measurement		No Discharge	Barrels /							
FLOW 1	Permit	 		Job				-∤			
August	Requirement		Report	"			l	1	1	1/job	Estimate
	Sample					1		+	 	17,00	Estimate
	Measurement		No Discharge	Barrels /							
	Permit			Job				1	-		
September	Requirement		Report						1	1/job	Estimate
<u>.</u>	Sample	1	12.0						†		
	Measurement		No Discharge	Barrels /			Ì				
	Permit			Job				1			
October	Requirement	l	Report			1			ŀ	1/job	Estimate
WELL TREATMENT, COMPLETION									i -		
AND WORKOVER FLUIDS											
OIL AND GREASE 1						MONTHLY	DAILY	7			
						AVERAGE	MAXIMUM				
	Sample							1			
	Measurement Permit					No Discharge	No Discharge	_			
August	Requirement					29.0	42.0	mg/L	i	40.7	
August	Sample					29.0	42.0		-	1/job	Grab
	Measurement					No Discharge	No Discharge	1			
	Permit			}		IN Discharge	140 Discharge	mg/L	_		
September	Requirement					29.0	42.0	""g/L		1/job	Grab
	Sample					20.0	72.0	<u>† </u>	-	17,00	Glab
	Measurement					No Discharge	No Discharge	l			
	Permit			ı				mg/L			
October	Requirement					29.0	42.0			1/job	Grab
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		CERTIFY UNDER PENALTY	OF LAW THAT THIS DOCUMENT AND AL	L ATTACHMENTS WERE PRO	SPANED UNDER MY		-	TELEPHONE		DATE	
		DIRECTION OR SUPERVISION	IN ACCORDANCE WITH A SYSTEM DE	SIGNED TO ASSURE THAT O	UNIFED						
David Rose		PERSONNEL PROPERLY CA	ATHER AND EVALUATE THE REGAMATE	ON SUBMITTED, BASED ON I	MY INGUINY OF THE						
Manager, Environmental, Health and Sa	afety	PERSON OR PERSONS WIK	NAMED THE SYSTEM, OR THOSE P	ERSONS DIRECTLY RESPON	FINLE FOR	7 6	1	(805) 934	-8220	11 17	2014
		GATHERING THE IMPORMATI	ION, THE INFORMATION BUBMITTED IS.	TO THE BEST OF MY KNOW	LEDGE AND	1 20. 1	Real				
		BELEF, TRUE, ACCUPATE, A	NO COMPLETE. I AM AWAPE THAT THE	THE ARE SIGNATIONAL PRIMA	LYES FOR	0					
		SUBMITTING FALSE INFORM	ARON INCLIDING THE POSSIBILITY OF	FRE AND IMPRISONMENT F	OR KNOWING						
			4 1001 A4O 33 U.S.C. 4 1319. (FEWLT)		MAY INCLUDE PINES	Signature of PRINCIPAL EX		Area		MONTH/DA	Y/YEAR
TYPED OR PRINTED	ANNA MON ATION M	UF TO STRUBBO AND OR MANE	HUM IMPRESONMENT OF BETWEEN II W	IONTHS AND 5 YEARS)		OFFICER or AUTHORIZED	AGENT	Code	Number		

Well Treatment and Completion & Workover fluids are injected or commingled with produced water and are not discharged separately. Refer to produced water monitoring requirements.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR)

No Discharge

X

CAG280000 PERMIT NO.

003 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD									
YR MO	DAY	YR	MO	DAY					
From:	14 08 01	1000	To:	14 10 31					

WELL TREATMENT, COMPLETION **AND WORKOVER FLUIDS (003)** (Injected or commingled with produced water) NOTE: Read instructions before completing this form.

		Quantity or Loading			Quality or Concentration				NO. Frequency		Sample
PARAMETER									EX.	Analysis	Туре
		Average	Maximum	Units	Minimum	Average	Maximum	Units	1		
WELL TREATMENT, COMPLETION	Sample					-		1			
AND WORKOVER FLUIDS	Measurement		0	Barrels /					1		
TYPE AND TOTAL NUMBER OF JOBS	Permit]		Job	· · · · · ·			7			
	Requirement		Report	1]	
WELL TREATMENT, COMPLETION	Sample		1]						-
AND WORKOVER FLUIDS 1 STATIC	Measurement					No Discharge		# Times			
SHEEN	Permit			7				Sheen			
August	Requirement	ì			Negative Static S	Sheen Test - # Times	observed-None	Observed	i	1/discharge	Grab
	Sample									1	
	Measurement]			İ	No Discharge		# Times			
	Permit			1				Sheen			
September	Requirement				Negative Static S	Sheen Test - # Times	observed-None	Observed	i	1/discharge	Grab
	Sample	1		1						,	
	Measurement		30		11	No Discharge		# Times	l		
	Permit			1				Sheen		· -	
October	Requirement				Negative Static S	Sheen Test - # Times	observed-None	Observed	ĺ	1/discharge	Grab
	Sample			† — —	181						
	Measurement								l		
	Permit			1				1			
	Requirement										
WELL TREATMENT, COMPLETION	Sample			1							
AND WORKOVER FLUIDS	Measurement				1	N/A					
Chemical Inventory	Permit			1				1			
August- October	Requirement					Report				1/iob	Report
<u> </u>	Sample							1 -			
	Measurement										
	Permit			1				1			
	Requirement										
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		CERTIFY UNDER PEWALTY	OF LAW THAT THE DOCUMENT AN	D ALL ATTACHWENTS WERE	PREPARED UNDER MY			TELEPHONE		DATE	
		DERECTION OR SUPERMISON	IN ACCORDANCE WITH A SYSTEM	H DESIGNED TO ASSURE TH	AT GUALIFED		1				
David Rose		PERSONNEL PROPERLY GA	THER AND EVALUATE THE INFORM	MATION SUSMITTED, BASED	OH MY INQUIRY OF THE			ļ			
Manager, Environmental, Health and Safe	ty	PERSON OR PERSONS WHO	NAMAGE THE SYSTEM, OR THOS	SE PERSONS SIRECTLY RES	POHISBLE FOR	Doing	Leave	(805) 934-	8220	11 17	2014
and an arrangement of the second		GATHERING THE INFORMATI	ON, THE IMPORMATION SUBMITTEE	D IS, TO THE BEST OF MY KI	KWLEDGE AND	→ ₩.		1			
		SELEF, TRUE, ACCURATE A	AD COMPLETE, I AM AWARE THAT	THERE ARE BIONEFICANT P	ENALTIES FOR						
		SUBMITTING FALSE INFORM	ATION INCLUDING THE POSSIBILITY	Y OF FREE AND IMPRESONNE	NT POR IDIOWING						
		VIOLATIONS, SEE 18 LLS.C.	6 1601 AMD 23 ILE.C. & 1319, PEN	ALTES UNDER THESE STAT	TUTES MAY INCLUDE PINES SIGNATURE OF PRINCIPAL EXECUTIVE			Area		MONTH/DA	Y/YEAR
TYPED OR PRINTED		UP TO STREET AND OR MANE	AUM IMPRISONMENT OF BETWEEN			OFFICER or AUTHORIZED			umber		
COMMENT AND EXPLANATION OF AN											

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

'Well Treatment and Completion & Workover fluids are injected or commingled with produced water and are not discharged separately. Refer to produced water monitoring requirements.

N / A: No WTCF this quarter.
EPA Form 3320-1 (Rev.9-88) Previous editions may be used.

(Replaces EPS Form T-40 which may not be used.)

File:DMR003.xls

Pg 9 of 19

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR)

No Dis	scharge

CAG280000
PERMIT NO.

004 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

	MONITORING PERIOD									
YR	MO	DAY	YR	MO	DAY					
F	From: 14	08 01		To:	14 10 31					

DECK DRAINAGE (004)

·	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·			NOTE: Read		s before completing	
PARAMETER		Quantity or Lo			Quality or C	Concentration		NO. EX.	Frequency Analysis	Sample Type
		Average	Units	Minimum	Average	Maximum	Units	1	·	
DECK DRAINAGE	Sample		Mo. Avg.				Ti Ti		1/month	Estimate
VOLUME-FLOW RATE	Measurement	4.7	bbl/day				1	0		
	Permit		1	- "			7		1/month	Estimate
August	Requirement	Report	l	1			1			
	Sample		Mo. Avg.							
	Measurement	No Discharge	bbl/day							ĺ
	Permit		Ī				7		1/month	Estimate
September	Requirement	Report					1		}	
	Sample		Mo. Avg.							
	Measurement	No Discharge	bbl/day				1			
	Permit		I				7		1/month	Estimate
October	Requirement	Report		<u>L</u> .			1	i i		
			18							
				<u>. </u>						
							7			
DECK DRAINAGE	Sample		ļ				ļ		1/dav	Visual -
FREE OIL	Measurement	l 0	# Days	No franciskia	al sheen on the rec			0	1/uay	
THE OIL	Permit		Sheen	IAO II GE OINAISTI	al sneen on the rec	zerving water.	-	0	1/day	Daylight Visual -
August	Requirement		Observed	No free olikieu	al sheen on the rec	oluina water			1/uay	Daylight
, tagases	Sample	 	00001100	110 1100 0121134	ar shooti on the rec	JOITHING WATER.				Dayngric
	Measurement	N/A	# Days		No Discharge					
	Permit		Sheen		rio Bioonargo	<u></u>	┪		1/day	Visual -
September	Requirement	l 0		No free oil/visus	al sheen on the rec	eiving water	1		,,aay	Daylight
	Sample			1100 000 000 1100	<u> </u>	civing water.	1			Dayiigiik
	Measurement	l I N/A	# Days		No Discharge	1				
	Permit		Sheen				1		1/day	Visual -
October	Requirement		Observed	No free oil/visus	al sheen on the rec	eiving water.			,	Daylight
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		CERTIFY LINCER PROMILTY OF LAW THAT THE DOCUMENT AN		NE PREPARED LINDER MY	752		TELEPHO	NË.	DATE	7.0
		DIRECTION OR SUPERMISION IN ACCORDANCE WITH A SYSTE	M DESIGNED TO ASSUME T	HAT QUALIFIED		. 0				
David Rose		PERSONNEL PROPERLY CATHER AND EMALUATE THE SHOOR	MATION SUBWITTED, SASE	D ON MY INQUIRY OF THE	400	012	1			
Manager, Environmental, Health and Safety		PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THO	SE PERSONS DIRECTLY RE	ESPONSIBLE FOR	1	1 oc	(805) 934	-8220	11 17	2014
	•	GATHERING THE INFORMATION, THE INFORMATION SUBMITTE	D. IS, TO THE DEST OF MY	NOW EDTE AND	T. Appendictions		1''			
		BELLEY, TRUE ACCURATE AND COMPLETE I AM AMARE THA	T THERE ARE SIGNIFICANT	PENALTIES FOR				[
		SUBMETTING PALSE PAPORMATION INCLUDING THE POSSIBLIT	Y OF FINE AND IMPRISONS	MENT FOR IGNOVING						
		VIOLATIONS, SEE 18 U.S.C. & 1001 AND 33 U.S.C. & 1315. PEI	ATUTES MAY INCLUDE PINES	THE MAY INCLUDE PINES SIGNATURE OF PRINCIPAL EXECUTIVE			J	MONTH/DA	Y/YEAR	
TYPED OR PRINTED		UP TO STOLERS AND OR MUNICIPAL IMPRESONABLY OF DETWEEN 6 MONTHS AND 5 YEARS						Area Code Number		
COMMENT AND EXPLANATION OF ANY	VIOLATION (Paterns									

NATIONAL POLLUTANT DISCHARGE BLIMINATION SYSTEM (IMPOES) DISCHARGE MONITORING REPORT (DMR)

No	Diec	hore	
140	DISC	:harg	ı

CAG280000 PERMIT NO. 005 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA LOCATION: 34º 27' 15"N, 120º 38' 48"W MONITORING PERIOD

YR MO DAY YR MO DAY

From: 14 08 01 To: 14 10 31

SANITARY & DOMESTIC WASTES (005) (Commingled)

		Quantity or Loading			Quality or Concentration				NO.	Frequency	Sample
PARAMETER	1							EX.	Analysis	Туре	
ALUTANY & BALIFATIA		Average	Maximum	Units	Minimum	Average	Maximum	Units	<u> </u>		
SANITARY & DOMESTIC	Sample									1/day	Estimate
WASTES FLOW RATE	Measurement	37.0		Monthly			1	_	0		
(Commingled)	Permit			Average		_				1/month	Estimate
August	Requirement	Report		bbl/day	<u> </u>			<u> </u>			
	Sample				ĺ	1	1	1	1	1/day	Estimate
	Measurement	42.0		Monthly				_	0		
	Permit			Average						1/month	Estimate
September	Requirement	Report		bbl/day							
	Sample								1	1/day	Estimate
	Measurement	38.0		Monthly					0		
	Permit			Average						1/month	Estimate
October	Requirement	Report		bbl/day					1		
SANITARY & DOMESTIC	Sample		_							1/day	Visual -
WASTES FOAM & FLOATING	Measurement		0	# days	No foam or floatin	g solids in the receiv	ring waters.	_	0		Daylight
SOLIDS (Commingled)	Permit			observed				1		1/day	Visual -
August	Requirement		0		No foam or floatin	g solids in the receiv	ring waters.				Daylight
	Sample							1		1/day	Visual -
	Measurement		0	# days	No foam or floatin	g solids in the receiv	ring waters.		0		Daylight
	Permit			observed				1		1/day	Visual -
September	Requirement		0		No foam or floatin	g solids in the receiv	ring waters.	1			Daylight
	Sample									1/day	Visual -
	Measurement		0	# days	No foam or floating	g solids in the receiv	ring waters.	<u> </u>	0		Daylight
	Permit			observed						1/day	Visual -
October	Requirement		0		No foam or floating	g solids in the receiv	ring waters.				Daylight
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		COERTIPY UNDER PENALTY	OF LAW THAT THE DOCUMENT	WD ALL ATTACHMENTS WE	RE PREPARED UNDER MY		15	TELEPHONE		DATE	
		DIRECTION OR SUPERVISION	IN ACCORDANCE WITH A EVET	EM DESIGNED TO ASSURE	THAT QUALIFIED	. 11 0	fRec				
David Rose		PERSONNEL PROPERLY GA	THER AND EVALUATE THE INFO	RMATION SUBMITTED, BASI	D ON MY INQUIRY OF THE	· / Ou	1 Car	1			
Manager, Environmental, Health and	Safety	PERSON OR PERSONS WHO	MANAGE THE SYSTEM, OR TH	OGE PERSONS DIRECTLY R	ESPONSIBLE POR			(805) 934	-8220	11 17	2014
		GATHERING THE INFORMATI	OIL THE INFORMATION SUBMITT	ED IS, TO THE BEST OF MY	KHOWLET/GE AND	10 mm					
		BELIEF, TRUE, ACCUPATE, A	ND COMPLETE, I AM AWARE TH	AT THERE ARE SIGNETICAL	PENALTES FOR						
		SUBMITTING FALSE INFORM	ATION INCLUDING THE POSSIBIL	STY OF PINE AND IMPRISON	MENT FOR KNOWING						
		WOLAHONE, SEE 16 U.S.C.	E 1001 AND 33 U.S.C. & 1319. PE	DIVILITIES UNDER THESE ST	ATUTES MAY INCLUDE FINES	Signature of PRINCIPAL EX	(ECUTIVE	Area		MONTH/DA	Y/YEAR
TYPED OR PRINTED		UP TO \$16,000 AND OR MANS	ALM IMPRESONMENT OF BETWEE	EN 6 MONTHS AND 5 YEAR		OFFICER or AUTHORIZED	AGENT	Code	Number	•	

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (PIPOES) DISCHARGE MONITORING REPORT (DMR)

No Discharge	
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CAG280000 PERMIT NO. 005 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD							
YR	MO	DAY	YR	MO	DAY		
Fr	om: 14	08 01		To:	14 10	31	

SANITARY & DOMESTIC WASTES (005) (Commingled)

						. 14 10 01		NOTE: Read	instructi	ons before comp	eleting this fo
PARAMETER		Quantity or Loading		Quality or Concentration			NO EX		Frequency Analysis	Sample Type	
- ALTE-OFIA (11) ASP - 7ALTICUS -		Average	Maximum	Units	Minimum	Average	Maximum	Units			"
DOMESTIC WASTE, VOLUME /	Sample										
FOAM (commingled with Sanitary) ₁	Measurement	<u> </u>				N/A		# of Days			
_	Permit							Observed		1 / day	Visual -
August	Requirement				No foam or float	ting solids in the rec	eiving water.				Daylight
	Sample										
	Measurement	<u> </u>				N/A		# of Days			
	Permit							Observed		1 / day	Visual -
September	Requirement	1			No foam or float	ing solids in the rec	eiving water.	<u></u>			Daylight
	Sample					#56" T					
	Measurement					N/A		_# of Days			
	Permit							Observed		1 / day	Visual -
October	Requirement				No foam or float	ing solids in the rec	eiving water.				Daylight
SANITARY / DOMESTIC	Sample	1				İ					
WASTE RESIDUAL	Measurement				N/A	N/A	N/A	mg/f	0	Monthly	Grab
CHLORINE 2	Permit							į į			
August	Requirement				1 mg/l	N/A	10 mg/l			Monthly	Grab
	Sample					1					
	Measurement				N/A	N/A	N/A	mg/l	0	Monthly	Grab
	Permit										
September	Requirement				1 mg/i	N/A	10 mg/l			Monthly	Grab
	Sample										
	Measurement				N/A	N/A	N/A	mg/l	0	Monthly	Grab
	Permit										
October	Requirement				1 mg/l	N/A	10 mg/l			Monthly	Grab
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	•	CERTIFY UNDER PERMATY O	OF LAW THAT THIS DOCUMENT A	O ALL ATTACHMENTS V	WERE PREPARED LINCOR MY			TELEPHONE		DATE	,
		OPECTION OF SUPERMISION	IN ACCORDANCE WITH A SYSTE	M DESIGNED TO ASSUR	E THAT QUALFIED	3	- 1				
David Rose		PERSONNEL PROPERLY GAT	THER AND EVALUATE THE SIFOR	MATION SUBMITTED, BA	SED ON MY INQUIRY OF THE		1/2		1		
Manager, Environmental, Health and Sa	afety	PERSON OR PERSONS WHO	MANAGE THE SYSTEM, OR THO	SE PERSONS DIRECTLY	RESPONSIBLE FOR	1 Our	f Rece	(805) 934-	8220	11 17	2014
11 0 1	·	GATHERING THE INFORMATIO	DN, THE INFORMATION SUBMITTE	D IS, TO THE BEST OF A	NY KNOWLEDOE AND	- 11		1 ' '			
)	SELEF, TRUE, ACCUPATE, A	ND COMPLETE, I AM AWARE THE	T THERE ARE SIGNAPICA	WIT PENALTIES FOR	1		<u> </u>			
		SUBMITTING FALSE INFORM	ATION HICLUDING THE POSSIBLE	Y OF FINE AND IMPRIOR	DIMEDIT FOR INIOWING				\neg		
		VIOLATIONS, SEE 16 ILE.C. S	1001 AND 33 U.E.C. & 1315. PG	WLTES UNDER THESE	STATUTES MAY INCLUDE FINES	Signature of PRINCIPAL EX	ECUTIVE	Area	- 1	MONTH/DA	Y/YEAR
TYPED OR PRINTED		LP TO STREET AND OR MANE	LA IMPRISONMENT OF BETWEE	N 4 MONTHS AND 5 YEA	ven	OFFICER or AUTHORIZED	AGENT	Code	Number		

¹ Reported with sanitary discharges.

The sewage treatment unit is a marine sanitation device that complies with pollution control standards and regulations under Section 312 of the Clean Water Act. Thus, it is deemed to be in compliance with permit limitations for sanitary waste discharges (as per Condition II.E.1 Footnote 2 of CAG280000)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (PADES) DISCHARGE MONITORING REPORT (DMR)

Nο	Disc	hai	~~

CAG280000
PERMIT NO.

008 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD							
YR MO DAY	YR MO DAY	_					
From: 14 08 01	To: 14 10 31						

FIRE CONTROL WATER (008) (deluge commingled with deck drains)

	•		1.0	14 00 01	1 10.	14 10 01	_				_
	T	1	Quantity or Lo	ooding	1	Quality on Co	- nantration	NOTE: Read in		Frequency	
PARAMETER		Country or Loading			Quality or Concentration			NO. EX.		Sample Type	
			Average	Units	Minimum	Average	Maximum	Units	1	1	•
FIRE CONTROL SYSTEM TEST WATER	Sample	1			No floating solids in	the receiving water.					Visual -
(008) - FOAM, FLOATING SOLIDS 1	Measurement		0	# Days	No foam in the rece	iving water.			0	1/day	Dayligh
(deluge commingled with deck drains)	Permit			Observed	No floating solids in	the receiving water.		7			Visual -
August	Requirement		0		No foam in the rece	iving water.		1		1/day	Dayligh
- "	Sample				No floating solids in	the receiving water.					Visual -
	Measurement		l o	# Days	No foam in the rece	iving water			10	1/day	Dayligh
	Permit			Observed	No floating solids in			7	Ť	.,,,,,	Visual -
September	Requirement	1	l o	i -	No foam in the race	•				1/day	Dayligh
	Sample				No floating solids in						Visual -
	Measurement		0	# Days	No foam in the rece	Wing water.		194	0	1/day	Dayligh
	Permit	1		Observed	No floating solids in	the-receiving water.		7			Visual -
October	Requirement	1	0		No foam in the recei	iving water.				1/day	Dayligh
						Monthly	Daily	ĺ			
						Average	Maximum		İ		
FIRE CONTROL SYSTEM	Sample										
TEST WATER (008) CHLORINE 12	Measurement					0.0012	0.0012	mg/l	0	1/quarter	Grab
	Permit	† · · · · · ·					1	-		quartar	
August- October	Requirement					0.00595	0.00953		i	1/quarter	Grab
				Î					$\overline{}$		
							İ				
				(#0)			1	1			
FIRE CONTROL SYSTEM TEST WATER	Sample			<u> </u>		l	<u></u>	<u> </u>			
Chemical Inventory	Measurement				See Attachme	nt #2 (Chemical I	nventory)				
	Permit										
August- October	Requirement					Report			-		
			70.	on If	38 Au	3500					
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER	1	I CERTIFY INCER PEHALTY	OF LAW THAT THES DOCUMENT	AND ALL ATTACHMENTS WE	RE PROPARED UNDER MY			TELEPHONE		DATE	
		DIRECTION OR SUPERMISON	HIN ACCORDANCE WITH A SYST	ON DECIGNED TO ASSUME	THAT CURLINED THAT		1				
David Rose Manager, Environmental, Health and Safety		PORTION OR ELPREMISON ON ACCORDANCE WITH A SYSTEM DESCRIPT DO ASSUME THAT CALLURED \$ PORSIONING, PROPERTY CARRIER AND RYNLLIATE THE SPC PRIMATION SUBMITTED, BASED ON MY SHOURT OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR					1				
							(805) 934	-8220	11 17	2014	
		GATHERING THE INFORMAT	ON, THE RECEMBATION SUBMIT	TED 15, TO THE BEST OF MY	IDIOWLEDGE AND	-	(200	1			
		BELIEF, TRUE ACCURATE, A	MO COMPLETE, I AM AWARE TO	AT THERE ARE BOMPICAN	PENALTIES POR						
		BLOWTTING FALSE INFORM	NATION INCLUDING THE POSSIBLE	LITY OF FINE AND INFRIBON	MENT FOR IPIDWING						
	-	VIOLATIONS. SEE 18 U.S.C.	4 1001 AND 33 ILE.C. & 131R P	ENALTHES UNDER THESE ST	ATUTES MAY INCLUDE FINES	Signature of PRINCIPAL E	(ECUTIVE	Area		MONTH/DAY/YE	AR
TYPED OR PRINTED		UP TO \$15,000 AND OR MAN	MUM IMPRESCRIMENT OF BETWE	DEN 6 MONTHS AND 6 YEAR		OFFICER or AUTHORIZED	AGENT	Code	Number		

¹ Fire control system test water is infrequent and uses the same source water and treatment as non-contact cooling water.

² Chlorine values reported above are post-dilution per EPA Plumes UM. Chlorine limits are post-dilution as listed in the permit, Appendix C.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (PPDES) DISCHARGE MONITORING REPORT (DMR)

No	Discharge	
. •	Diacilal 86	

CAG280000
PERMIT NO.

009 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD						
YR MO DAY	YR MO DAY					
From: 14 08 01	To: 14 10 31					

NON-CONTACT COOLING WATER (009)

							NOTE: Read	Instruction	ns before comple	ting this form.
PARAMETER		Quantity or Loading			Quality or Concentration				Frequency Analysis	Sample Type
		Average	Units	Minimum	Average	Maximum	Units	1		.,,,,,
NON-CONTACT COOLING WATER (009) - FLOW VOLUME	Sample Measurement	111,429	Barrels/					0	1/month	Estimate
August	Permit Requirement	Report	Day				1		1/month	Estimate
	Sample						<u> </u>			
	Measurement	111,429	Barrels/					0	1/month	Estimate
September	Permit Requirement	Report	Day						1/month	Estimate
	Sample						 		1/IIIOItu1	
	Measurement	111,429	Barrels/			4	4		1/month	Estimate
October	Permit Requirement	Report	Day						1/month	Estimate
NON-CONTACT COOLING WATER (009) - FOAM	Sample Measurement	0	# Days	No foam in the				0	1/day	Visual - Daylight
FLOATING SOLIDS August	Permit Requirement	0	Observed	No floating solid No foam in the	ds in the receiving	water.			414	Visual -
August	Sample						-		1/day	Daylight
	Measurement	0	# Days	No foam in the				0	1/day	Visual - Daylight
September	Permit Requirement	0	Observed	No floating solids in the receiving water. No foam in the receiving water. No floating solids in the receiving water. No foam in the receiving water.					1/day	Visual - Daylight
- Coptonia di	Sample									Visual -
	Measurement	0	# Days				_	0	1/day	Daylight
October	Permit Requirement	0	Observed	No floating solid No foam in the	is in the receiving receiving water.	water.			1/day	Visual - Daylight
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		CERTIFY LINGER PENALTY OF LAW THAT THIS DOCUMEN	AND ALL ATTACHMENTS WERE	PHEPWHED UNDER MY			TELEPHONE		DATE	
David Rose Manager, Environmental, Health and Safety		DIRECTION OR BUPERANSION IN ACCOMMANCE WITH A SYSTEM DESIGNED TO ASSURE THAT COMMINED PERSONNEL PROPERLY GATHER AND SYMULATE THE INFORMATION BUBINITIES, BASED ON MY INDUSTRY OF THE PURSON ON PERSONS WHO MANAGE THE SYSTEM, ON THOSE PERSONS DIRECTLY RESPONSIBLE FOR			(805) 934	-8220	11 17	2014		
		Gathering the information, the information submi belief, tirle, accurate, and complete, I am amane	TIED IS, TO THE BEST OF MY IS THAT THERE ARE SIGNIFICANT F	IOWLEDGE AND EMALTIES FOR						
TYPED OR PRINTED		Submitted false profestion including the posses violations. SEE 18 U.S.C. & 1001 and 30 U.S.C. & 1318, i UP TO 516,000 and or manerum suppressament of betty	ILITY OF FINE AND IMPRISONME PENALTIES UNDER THESE STAT FEIDN & MONTHE AND & YEARS)	NT POR ICHOMING.	Area Code	Number	MONTH/D	AY/YEAR		

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (APDES) DISCHARGE MONITORING REPORT (DMR)

Nο	Discharge	
140	Discussion No.	

CAG280000	
PERMIT NO.	

009 DISCHARGE NO.

Approved Form OMB No. 2000-0015

PLATFORM HERMOSA

LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD									
YR MO DAY	YR MO DAY								
From: 14 08 01	To: 14 10 31								

NON-CONTACT COOLING WATER (009)

·							NOTE: Read i	nstructions	before completin	g this form.
	_	Quantity or Loading			Quality or Co	oncentration		NO.	Frequency	Sample
PARAMETER		Average	Units	Minimum	Monthly Average	Daily Maximum	Units	EX.	Analysis	Туре
NON-CONTACT COOLING WATER (009) - CHLORINE ₁	Sample Measurement				N/A	N/A	mg/l			
	Permit Requirement				N / A ₂	N/A ₂			1/year	Grab
NON-CONTACT COOLING WATER (009)	Sample Measurement			See American	#0 (Ob!11				44	
CHEMICAL INVENTORY	Permit			See Attachmen	nt #2 (Chemical I	nventory)	- 1	0	1/month	List
August- October	Requirement			ļ	Report				1/month	List
							_			
					··					
IAME/TITLE PRINCIPAL EXECUTIVE OFFICER	I CENTY	PY UNDER PERMITY OF LAW THAT THIS COCUMENT AS SON OR SUPERMICION IN ACCORDANCE WITH A SYSTE		ENE PREPARED UNDER NY 8	67 50	0	TELEPHONE		DATE	
David Rose	1	DIANG, PROPERLY GATHER AND EVALUATE THE INFOR		DED ON MY SIGURY OF THE	Dans	France				
Manager, Environmental, Health and Safety		PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR					(805) 934	-8220	11 17	2014
		PRING THE REFORMATION, THE REFORMATION SUBMETS TRUET, ACCURATE, AND COMPLETE, I AM ANMED THE						ĺ		
		THIS, ACCUMANT, AND COMPLETE, I AM ANNANE THE		-						
	VIOLAT				Signeture of PRINCIPAL EX		Area	Nh mak	MONTH/DA	Y/YEAR
TYPED OR PRINTED COMMENT AND EXPLANATION C	UP TO S	STA, SOR AND OR HAVIMUM IMPRESONMENT OF BETWEE	EN 6 MONTHS AND 5 YEAR	19	OFFICER or AUTHORIZED	AGENT	Code	Number		

THE R. P. LEWIS CO., LANSING,

¹ When applicable, chlorine values reported above are post-dilution per EPA Plumes UM. The annual chlorine residual was completed on July 24 and reported in the previous DMR.

² There are no limits in the Permit, Appendix C.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR)

No	Discharge
LAO	Discharge

X

CAG280000 PERMIT NO.

019 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA LOCATION: 34º 27' 15"N, 120º 38' 48"W

MONITORING PERIOD									
YR	MO "	DAY	YR	MO	DAY				
	From:	14 08 01		To: 1	4 10 31				

EXCESS CEMENT SLURRY (019)

				-			NOTE: Read in	structions b	efore completing th	is form.	
PARAMETER		Quantity or Loading		Quality or Concentration				NO. EX.	Frequency Analysis	Sample Type	
		Average	Units	Minimum	Average	Maximum	Units	1	1	1 "	
EXCESS CEMENT SLURRY (019)	Sample		1							T*	
FLOW VOLUME	Measurement	No Discharge	Monthly								
	Permit		Average*	77			7				
August	Requirement	Report	bbl/day			1		1	1/month	Estimate	
· ·	Sample										
	Measurement	No Discharge	Monthly				1	ı			
	Permit		Average*				7			l	
September	Requirement	Report	bbl/day	(i) +0 -0.040	0.00			1	1/month	Estimate	
	Sample	- 1						1			
	Measurement	No Discharge	Monthly	1	ĺ			1			
	Permit		Average*				7			1	
October	Requirement	Report	bbl/day	İ		1	1	1	1/month	Estimate	
	Sample						1				
ANNUAL CUMULATIVE VOLUME 1	Measurement	0	Barrels/	ľ				0		l	
	Permit 1		Year				7				
03/01/14 - 02/28/15	Requirement	2,000						1			
EXCESS CEMENT SLURRY (019)	Sample						1			1	
SHEEN TEST/FREE OIL	Measurement	No Discharge	# Days	1	No Discharge						
FOAM, FLOATING SOLIDS	Permit		Sheen	No foam or fi			1		1/well	Visual	
August	Requirement	None	Observed	No Oil					1/day	Rec. Wate	
	Sample										
	Measurement	No Discharge	# Days		No Discharge		(*	1			
	Permit		Sheen	No foam or fl			┪	_	1/well	Visual	
September	Requirement	None	Observed						1/day	Rec. Wate	
	Sample		-	1	***************************************		 	† 		11001 11010	
	Measurement	No Discharge	# Days		No Discharge		1				
	Permit			No foam or fle			1	—	1/well	Visual	
October	Requirement	None	Observed					1	1/day	Rec. Wate	
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND A	ATTACHMENTS WERE PR	EPARED LINDER MY			TELEPHONE		DATE	1	
		THE PARTY OF CHIEF PARTY IN ACCORDANCE WITH A COURTS OF COUNTRY OF CHIEF THAT THE EXTR				1	1222111011				
David Rose Manager, Environmental, Health and Safety		DIRECTION ON BUPENMONTH IN ACCIDENCIES, WITH A SYSTEM DESCRIBED TO ASSURE THAT CALLIFEST PROSPORED, TO AND THE AND EXHLURIST THE SPECIMENT ON BUBENTED, BASED ON INT SHOUGHY OF THE APPROVED THE OPPOSED WHO INMANDE THAT SYSTEM, OF PROVIDES PROBLEME SPECIALLY RESPONSIBLE FOR GATERINAD THE SPECIMENTON. THE SPECIMENTON BUBENTETON. TO THE SECT OF MY CHAMPLEDGE AND			!) and	1/2	Į.				
					1 and	0.00	(805) 934	-8220	11 17	2014	
					DOE NO.						
		BOLLEF, TRUE, ACCURATE, AND COMPLETE, I AM AWARE THAT TH	ERE ARE BIGHIFICANT PENN	LTIES FOR			1				
		SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBLITY OF	FINE AND IMPRESCRIPTOR	OR KNOWING			1				
	-	VOIATIONS, SEE TRUBE & 1801 AND 23 U.S.C. & 1215, FEMALE	ES LINCES THESE STATUTE	S MAY INCLUDE FINES	Signature of PRINCIPAL EX	ŒCUTIVE	Area		MONTH/DAY/Y	EAR	
TYPED OR PRINTED	Į.	UP TO S10,000 AND OR MANINUM IMPRISONMENT OF BETWEEN 5			OFFICER or AUTHORIZED AGENT Code			Number		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
		(Peference ell ettechmente he			PARTICULAR OF MOTHORIZED	- FRANCISI	1000	114111001	L		

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

Annual cumulative volume limit is applied to the cumulative volumes for the period of March 2014 through February 2015.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (PPDES) DISCHARGE MONITORING REPORT (DMR)

Discharge	

CAG280000
PERMIT NO.

006,007,010,011,012,013,014 DISCHARGE NO. Desatination Unit App Ballast/Storage Displacement OM Bilge Water

Blowout Preventer Fluids

Approved Form OMB No. 2000-0015

PLATFORM HERMOSA LOCATION: 34º 27' 15"N, 120º 38' 48"W MONITORING PERIOD

YR MO DAY

YR MO DAY

From: 14 08 01

To: 14 10 31

Distomaceous Earth Filter Media

	T				·-			NOTE: Read insi		Frequency	orm.
PARAMETER			Quantity or Lo	pading		Quality or Co	ncentration		NO.		Sample Type
		Average	Maximum	Units	Minimum	Average	Maximum	Units	1	1	1 "
(006) Blowout Preventer Fluids	Sample								1		
FREE OIL, FOAM, FLOATING	Measurement					No Discharge		i			
SOLIDS	Permit				No free oil or floati	ng solids in the receiving w	ater.	7		1/month	Visual
August- October	Requirement				No foam, in other ti	nan trace amounts, in the r	eceiving water.			1/discharge	Rec. Water
(007) Desalination Unit	Sample					the receiving water.	10		1 "	1/month	Visual
FOAM, FLOATING	Measurement				No foam, in other th	nan trace amounts, in the r	aceiving water.		0	1/discharge	Rec. Water
SOLIDS	Permit					the receiving water.		7		1/month	Visual
August- October	Requirement				No foam, in other th	nan trace amounts, in the re	sceiving water.			1/discharge	Rec. Water
(010) Ballast/Storage Displacement	Sample										†
Water - FLOW RATE	Measurement			Monthly		No Discharge					
FREE OIL, FOAM, FLOATING SOLIDS	Permit			Average	No free oil or floatir	ng solids in the receiving w	nter.	7		1/month	Estimate /
August- October	Requirement			bbl/day	5 GALACAC - 1111	nen trace amounts, in the re				1/discharge	Visual Davlig
(011) Bilge Water	Sample				1			1			, ,
FLOW RATE	Measurement			Monthly		No Discharge					i
	Permit			Average	No free oil or floatir	ng solids in the receiving we	nter.	1		1/month	Estimate
August- October	Requirement			bbl/day	No foam, in other th	an trace amounts, in the re	celvina water.			1/discharge	
(012) Boiler Blowdown	Sample										
FOAM, FLOATING SOLIDS	Measurement					No Discharge					l
	Permit				No floating solids in	the receiving water.		1		1/month	Visual
August- October	Requirement				No foam, in other th	an trace amounts, in the re	ceiving water.			1/discharge	Rec. Water
(013) Test Fluids *	Sample										
FLOW RATE	Measurement			Monthly		No Discharge]
FREE OIL, FOAM, FLOATING SOLIDS	Permit			Average	No free oil or fleetin	g solids in the receiving we	iter	1	\vdash	1/month	Estimate /
August- October	Requirement			bbl/day		an trace amounts, in the re			1 1	1/discharge	Visual Daylig
(014) Diatomaceous Earth Filter Media	Sample					and a decided an	CONTRACTOR CONTRACTOR	1	1 1		
FREE OIL, FOAM, FLOATING	Measurement					No Discharge			1 1		
SOLIDS	Permit				No free oil or floatin	g solids in the receiving wa	ter.	1		1/month	Visual
August- October	Requirement	l			100	an trace amounts, in the re			i I	1/discharge	Rec. Water
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		CERTIFY UNDER PENALTY O	OF LAW THAT THEE DOCUMENT A	MD ALL ATTACHMENTS WE	•		172	TELEPHONE		DATE	
		DIRECTION OR SUPERVISION	IN ACCORDANCE WITH A SYSTE	EN DESIGNED TO ASSUME	THAT CLINUFIED	8 1 6	. 1				
David Rose		PERSONNEL PROPERLY OA	THER AND EVALUATE THE INFO	RMATION SUBMITTED, BASI	ED ON MY INQUIRY OF THE	1 /0.	flear				
Manager, Environmental, Health and Safety		PERSON OR PERSONS WHO	MANAGE THE SYSTEM, OR TH	DEE PERSONS DIRECTLY R	ESPONSINLE POR	1	0 000	(805) 934-	-8220	11 17	2014
	-	GATHERING THE INFORMATION	ON, THE INFORMATION SUBMET	ECO SS., TO THIS BEST OF MY	HHOWLEDGE AND			`			
		NELEF. TRUE, ACCURATE, A	NO COMPLETE, I AM ANNARE TH	AT THERE ARE SIGNIFICANT	PENALTIES FOR						
	ſ	SUBMITTING FALSE INFORM	ATION INCLUDING THE POSSIBIL	TY OF FINE AND IMPRISON	MENT FOR IOIOMBIG				<u>-</u>		
		VIOLATIONS, SEE 18 U.S.C. 4	1001 AND 30 LLB.C. & 1319. PR	DALTES WOER THESE ST	AWITES MAY INCLUDE FRED	Signeture of PRINCIPAL EXE	CUTIVE	Area		MONTH/E	AY/YEAR
TYPED OR PRINTED	Į,	P TO STIGUED AND OR MANE	IUM IMPRISONMENT OF BETWE	EN 4 MONTHS AND 5 YEAR		OFFICER or AUTHORIZED	AGENT	Code 1	Number		

^{*} See Attachment 2 for Chemical Inventory, if discharged.

NATIONAL POLLUTANT DISCHARGE BLIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR)

Discharge	

NOTE: Read instructions before completing this form.

	CAG280000	015, 016, 017, 018, 020, 021	Bulk Water Transfer Overflow	Approved Form
	PERMIT NO.	DISCHARGE NO.	Uncontaminated Water	OMB No. 2000-0015
			Water Flooding Discharges	
	MONITOR	ING PERIOD	Laboratory Wastes (commingled with	produced water)
-	YR MO DAY	YR MO DAY	Muds, Cuttings, Cement at Sea F	
	From: 14 08 01	To: 14 10 31	Hydrotest Water	

PLATFORM HERMOSA LOCATION: 34º 27' 15"N, 120º 38' 48"W

		_						HOIE. HERO III	n ncacus De	tore completing this	iom.
PARAMETER			Quantity or Lo	pading	(4 card only)	Quality or Co	ncentration		NO. EX.	Frequency Analysis	Sample Type
			Average	Units	Minimum	Average	Maximum	Units	7	,	,,,,
(015) Bulk Transfer Water Overflow	Sample										
FOAM, FLOATING SOLIDS	Measurement			1		No Discharge			1		
	Permit				No floating solids in	the receiving water.		1		1/month	Visual
August- October	Requirement				No foam, in other th	an trace amounts, in the	receiving water.			1/discharge	Rec. Water
(016) Uncontaminated Water	Sample	i									
FOAM, FLOATING SOLIDS	Measurement					No Discharge		į	L		
	Permit				No floating solids in	the receiving water.		1		1/month	Visual
August- October	Requirement	ļ		<u></u>	No foam, in other th	an trace amounts, in the I	receiving water.		Ì	1/discharge	Rec. Water
(017) Water Flooding Discharges	Sample	1									
FREE OIL, FOAM, FLOATING	Measurement					No Discharge		j		L	L
SOLIDS*	Permit				No free oil or floatin	g solids in the receiving w	rater.	1		1/month	Visual
August- October	Requirement			L	No foam, in other th	an trace amounts, in the I	receiving water.]		1/discharge	Rec. Water
(018) Laboratory Wastes	Sample					N/A		}			
FREE OIL, FOAM, FLOATING SOLIDS	Measurement				(refer to p	roduced water req	uirements)	_			
(commingled with produced water)	Permit				No free oil or floating	g solids in the receiving w	rater.] =		1/month	Visual
August- October	Requirement	l	L		No foam, in other th	an trace amounts, in the r	eceiving water.		1	1/discharge	Rec. Water
(020) Muds, Cuttings, Cement at Sea	Sample					**					
FLOOR FREE OIL, FOAM,	Measurement					No Discharge					
FLOATING SOLIDS	Permit				No free oil or floating	g solids in the receiving w	ater.	1		1/month	Visual
August- October	Requirement				No foam, in other the	an trace amounts, in the r	ecelving water.			1/discharge	Rec. Water
(021) Hydrotest Water *	Sample			İ	1						
FLOW RATE / FREE OIL, FOAM	Measurement			Monthly	1	No Discharge				ļ	
FLOATING SOLIDS	Permit			Average	No free oil or floating	g solids in the receiving w	ater.	1		1/month	Estimate /
August- October	Requirement	ļ		bbl/day	No foam, in other the	an trace amounts, in the r	eceiving water.	j	1	1/discharge	Visual Daylight
(021) Hydrotest Water	Sample					No	No				
CHLORINE	Measurement					Discharge	Discharge	ug/L			
	Permit	1]				1		1/month	
August- October	Requirement					* 7.5	* 13			1/discharge	Grab
NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		I CERTIFY UNDER PENALTY	OF LAW THAT THIS DOCUMENT	WO ALL ATTACHMENTS WE	THE PREPARED UNDER MY			TELEPHONE		DATE	
		DIRECTION OR SUPERMISION	TAYS A HITW SOMADROCOOK HE H	EN DESIGNED TO ASSUME	THAT QUALIFIED						
David Rose		PERSONNEL PROPERLY OF	ATHER AND EVALUATE THE INFO	PANATION SUBMITTED, BASI	ED ON MY INQUIRY OF THE		0	ĺ			
Manager, Environmental, Health and Sa	fety	PERSON OR PERSONS WH	O WANAGE THE SYSTEM, OR TH	OGÉ PÉRSONS DIRECTLY R	ESPONSIBLE FOR	!) and ((805) 934	-8220	11 17	2014
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COMMENT AND EXPLANATION OF A	NV VIOLAT	ION /Deferen	on all attaches	ante hara \		-					

COMMENT AND EXPLANATION OF ANY VIOLATION (Reference all attachments here.)

The reservoir to a comment of

^{*} See Attachment 2 for Chemical Inventory, if discharged.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGE MONITORING REPORT (DMR)

No	Discharge
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X	_

CAG280000 PERMIT NO. 022 DISCHARGE NO. Approved Form OMB No. 2000-0015

PLATFORM HERMOSA LOCATION: 34º 27' 15"N, 120º 38' 48"W

<u>MONITORII</u>	NG PERIOD	
YR MO DAY	YR MO DAY	
From: 14 08 01	To: 14 10 31	

H2S Gas Processing Waste Water

,				14 00 01	10.	14 10 31	_			ng waste wa		
			A		T		<u></u>	NOTE: Read			fore completing this form	
PARAMETER			Quantity or Lo			Quality or Concentration			NO. EX.	Frequency Analysis	Sample Type	
		Average	Maximum	Units	Minimum	Average	Maximum	Units	1		• • •	
022) H2S Gas Processing Waste Water	Sample	No			1							
FLOW RATE	Measurement	Discharge		Monthly				İ	İ			
	Permit			Average								
August- October	Requirement	Report		bbl/day					1	1/discharge	Estimat	
022) H2S Gas Processing Waste Water	Sample				***	11 11 11 11						
FREE OIL, FOAM, FLOATING SOLIDS	Measurement				<u> </u>	No Discharge		╛	L			
	Permit				No free oil or floatin	g solids in the receiving w	eter.	7			Visual -	
August- October	Requirement				No feam, in other th	an trace amounts, in the r	eceiving water,	<u>i</u>		1/discharge	Dayligh	
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David Dana			IN ACCORDANCE WITH A SYSTE				3		İ			
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Attachment 2 Chemical Inventory

ATTACHMENT 2 PLATFORM HERMOSA MISCELLANEOUS DISCHARGES CHEMICAL INVENTORY

August 1, 2014 through October 31, 2014

<u>Fluid Type</u>	<u>Volume</u>	Product Name	Estimated Chemical <u>Quantity</u> ₂	Average End-of-Pipe Concentration
	(Monthly avg bbls per day)		(Monthly avg gal per day)	(mg/l)
009 Non-contact Cooling Water		Chlorine		
August	· ·		0.75	0.16
September	111,429		1.17	0.25
October	111,429		1.31	0.28
008 Fire Control System Water ₁		Chlorine		
August	457		0.003	0.17
September	446		0.003	0.16
October	411		0.004	0.21
013 Test Fluids	No Discharge	No Discharge	None	None
017 Water Flooding Discharges	No Discharge	No Discharge	None	None
021 Hydrotest Water	No Discharge	No Discharge	None	None

¹ Firewater volumes are estimated based on one 30 minute test approximately every 4 days (refer to cover letter).

² End-of-pipe concentration and chemical quantity calculated with Operations daily monitoring results using a non-EPA chlorine test method (Hach DPD Color Wheel). This method is not an official EPA test method, but using this data better represents the chemical inventory values from month to month since the official EPA test method is required only quarterly.

Attachment 3

Undissociated Sulfide Conversion Calculation Table

Platform Hermosa- Percent Undissociated sulfides (H2S) vs Total Sulfide:

DMR Quarter: August - October 2014

Standard Methods 19th Edition 1995, page 4-129

Enter Temperature as Kelvin where Temp K= Temp C+273.15 (automatic conversion at the bottom of this page).

August				Calculation As fresh water		Calculation As ocean water		Calculation		
Ocean pH Produced Water pH	8.1 7	Permit Historical	A	0.501		A	-0.115	A	-0.138	
Produced Water Temp. Ocean Water Temp Total Sulfides (Std. Mthd. 4500 S-2F)	352.59 k 288.15 k 150 mg/l	6-Aug-14	pfm /	0.059 0.02		B	0.00959 0.82	В	0.00983	
Dilution * Conductivity (produced water)	2148 61500	Qtr. Avg. Historical	St pK	4.6875E-03 7.11	mole	S pK'	30 6.77	S pK	27 6.66	Dec.04
"I" (produced water) Conductivity (ocean water)	1.0 51300	6-Aug-14	K' [H]	1.01E-07 2.04E-07		K' [H]	1.70E-07 1.03E-08	K [H]	2.18E-07 1.26E-07	
"I" (ocean water)	0.82		[H2S] H2S as S	3.13E-03 100.16	mole mg/L	[H2S] H2S as S pfm	2.68E-04 mole 8.58 mg/L 0.115	[H2S] H2S as S pfm	1.72E-03 54.99 0.102	mg/L
% H2S: Conc. as H2S (undissociated)							5.72% 8.58 mg/l		36.66% 54.99	mg/l
H2S Post Dilution: H2S Post Dilution (ug/l):							0.0040 mg/l 3.997 ug/l		0.0256 25.601	mg/i ug/i

Conditions:

Ocean water pH:8.1, salinity 30 g/kg as listed in the General NPDES permit. Produced water Temperature, pH and conductivity based on averages.

I = 1.6x10-5 Conductivity (Stand.Methods 19th Edition, page 2-31).

Ocean water conditions for pH, Temp, Salinity, and conductivity will dominate over those for produced water at the edge of the 100m mixing zone. pK' (under ocean water) uses pK (7.11 as freshwater) in the PK' calculation which also includes standard ocean conditions (for pH, Salinity, Temp).

Temperature conversion:			
C = 5/9 (F-32)	Temp F	Temp Temp. K	
Produced Water:	175	79.44 352.59	
Ocean Water:	59	15.00 288.15	

^{*} Dilution calculated from quarterly average flow rate and the outfall configuation for this reporting quarter.

Platform Hermosa-Percent Undissociated sulfides (H2S) vs Total Sulfide:

DMR Quarter: August - October 2014

Standard Methods 19th Edition 1995, page 4-129

Enter Temperature as Kelvin where Temp K= Temp C+273.15 (automatic conversion at the bottom of this page).

September			Calculation As fresh wa			Calculation As ocean			Calculation as Produce	S AND DESIGNATION	
Ocean pH Produced Water pH Produced Water Temp. Ocean Water Temp Total Sulfides (Std. Mthd. 4500 S-2F) Dilution * Conductivity (produced water) "I" (produced water) Conductivity (ocean water) "I" (ocean water)	8.1 7 352.59 k 288.15 k 125 mg/l 2148 61500 1.0 51600 0.83	Permit Historical 8-Sep-14 Qtr. Avg. Historical 8-Sep-14	A pfm / St pK K' [H] [H2S] H2S as S	0.501 0.059 0.02 3.9063E-03 7.11 1.01E-07 2.04E-07 2.61E-03 83.47	mole mole mg/L	A B / S pK' K' [H] [H2S] H2S as S	0.114	mole mg/L	B I S pK K [H] [H2S] H2S as S pfm	-0.138 0.00983 1.0 27 6.66 2.18E-07 1.26E-07 1.43E-03 45.83 0.102	
% H2S: Conc. as H2S (undissociated) H2S Post Dilution: H2S Post Dilution (ug/l):			:				0.0033 r	mg/l mg/l ug/l		36.66% 45.83 0.0213 21.334	mg/l mg/l ug/l

Conditions:

Ocean water pH:8.1, salinity 30 g/kg as listed in the General NPDES permit. Produced water Temperature, pH and conductivity based on averages.

I = 1.6x10-5 Conductivity (Stand.Methods 19th Edition, page 2-31).

Ocean water conditions for pH, Temp, Salinity, and conductivity will dominate over those for produced water at the edge of the 100m mixing zone. pK' (under ocean water) uses pK (7.11 as freshwater) in the PK' calculation which also includes standard ocean conditions (for pH, Salinity, Temp).

Temperature conversion:			
C = 5/9 (F-32)	Temp F	Temp Temp. K	
Produced Water:	175	79.44 352.59	
Ocean Water:	59	15.00 288.15	

^{*} Dilution calculated from quarterly average flow rate and the outfall configuation for this reporting quarter.

Platform Hermosa- Percent Undissociated sulfides (H2S) vs Total Sulfide:

DMR Quarter: August - October 2014

Standard Methods 19th Edition 1995, page 4-129

Enter Temperature as Kelvin where Temp K= Temp C+273.15 (automatic conversion at the bottom of this page).

October			Calculation As fresh was			Calculation As ocean		Calculation as Produce		
Ocean pH Produced Water pH Produced Water Temp. Ocean Water Temp Total Sulfides (Std. Mthd. 4500 S-2F) Dilution * Conductivity (produced water) "I" (produced water)	8.1 7 352.59 k 288.15 k 170 mg/l 2148 61500 1.0	Permit Historical 9-Oct-14 Qtr. Avg. Historical	pfm I St pK K'	0.501 0.059 0.02 5.3125E-03 7.11 1.01E-07	mole	A B I S pK' K'	-0.115 0.00959 0.82 30 6.77 1.70E-07	B I S pK K	-0.138 0.00983 1.0 27 6.66 2.18E-07	Dec.04
Conductivity (ocean water) "I" (ocean water)	51400 0.82	9-Oct-14	[H] [H2S] H2S as S	2.04E-07 3.55E-03 113.52	mole mg/L	[H] [H2S] H2S as S pfm	1.03E-08 3.04E-04 mole 9.73 mg/L 0.115	[H] [H2S] H2S as S pfm	1.26E-07 1.95E-03 62.32 0.102	mg/L
% H2S: Conc. as H2S (undissociated) H2S Post Dilution: H2S Post Dilution (ug/l):							5.72% 9.73 mg/l 0.0045 mg/l 4.528 ug/l		36.66% 62.32 0.0290 29.015	mg/l mg/l ug/l

Conditions:

Ocean water pH:8.1, salinity 30 g/kg as listed in the General NPDES permit. Produced water Temperature, pH and conductivity based on averages.

I = 1.6x10-5 Conductivity (Stand.Methods 19th Edition, page 2-31).

Ocean water conditions for pH, Temp, Salinity, and conductivity will dominate over those for produced water at the edge of the 100m mixing zone.

pK' (under ocean water) uses pK (7.11 as freshwater) in the PK' calculation which also includes standard ocean conditions (for pH, Salinity, Temp).

Temperature conversion:			
C = 5/9 (F-32)	Temp F	Temp Temp. K	
Produced Water:	175	79.44 352.59	
Ocean Water:	59	15.00 288.15	

^{*} Dilution calculated from quarterly average flow rate and the outfall configuation for this reporting quarter.

Attachment 4 Fire Water Chlorine Residual Results

ATTACHMENT 4 PLATFORM HERMOSA FIRE WATER CHLORINE RESULTS August 1, 2014 through October 31, 2014

<u>Discharge</u>	Measurement <u>Frequency</u>	Average Monthly Limit* Post Dilution (mg/l)	Maximum Daily Limit* Post Dilution (mg/l)	Result Post Dilution (mg/l)	End-of-Pipe Concentration (mg/l)	EPA Plumes <u>Dilution</u>
008 Fire Control System Water Sampled 08/06/14	Once/Quarter	0.00595	0.00953	0.0012	EP A Method 330.5 0.2	5 161:1

N / A: There are no limits in the permit.

^{*} Post-dilution limits are listed in the permit, Appendix C.

Attachment 5 Miscellaneous NPDES Monitoring

ATTACHMENT 5 PLATFORM HERMOSA MISCELLANEOUS MONITORING May 1, 2014 through July 31, 2014

Sample Location	Sample Dat	<u>Constituents</u>	EPA Method	<u>Lab Value</u>	<u>Units</u>
Ocean Water at Fire Water Pumps	8/6/2014	Specific Conductivity	120.1	51,300	unhos/cm
	9/8/2014	Specific Conductivity	120.1	51,600	unhos/cm
Produced Water	9/18/2014	Benzene	602	0.9	mg/L
	9/18/2014	Copper	200.7	< 0.004	mg/L
	9/18/2014	Oil and Grease	1664	64.0	mg/L
	9/18/2014	Total Sulfide	4500S ⁻² F	160	mg/l
	9/18/2014	Benzo (a) anthracene	625	< 0.0038	mg/L
	9/18/2014	Benzo (a) pyrene	625	< 0.0026	mg/L
	9/18/2014	Benzo (b) fluoranthene	625	< 0.0028	mg/L
	9/18/2014	Benzo (k) fluoranthene	625	< 0.0044	mg/L
	9/18/2014	Chrysene	625	< 0.0038	mg/L
	9/18/2014	Dibenzo (a,h) anthracene	625	< 0.0016	mg/L

Specific Conductivity results were used in sulfide conversion calculations.

² The produced water samples on September 18 were taken following a BSEE sampling event and the results are included in the DMR.

Attachment 6

Laboratory reports for Oil and Grease and additional NPDES monitoring

Laboratory Quality Control Reports



September 2, 2014

Attn: Ruth Juris

Quarterly NPDES chlorine residual on the fire water outlet is as follows:

Sample Date / Time	Location	Total Chlorine Residual (EPA Method 330.5)
	Platform Hermosa	End of Pipe
August 6, 2014 @ 1700 hrs	Firewater Outlet	0.2 mg/l
LTS Meter S/N: 12040E195572 Technician: Mike Apple		Method Blank < 0.05 mg/l (MDL)

S.G. Lawry

Environmental Specialist / LTS



September 8, 2014

Quality Control

As part of the annual in-house quality control chlorine meter check and to ensure proper operation of the meters, LTS Environmental performed a total residual chlorine test with a known value obtained from RT Corporation. Results of this test are as follows:

Test Date	Total Residual Chlorine
September 5, 2014	(EPA Method 330.5)
LTS meter (SN 0412000883°	75) 0.57 mg/l
LTS meter (SN 12040E1955	72) 0.52 mg/l
RT Corporation test sample:	
(Lot #QC1065-021081)	t .
Acceptance Limits	$0.481 - 0.835 \mathrm{mg/l}$
Certified Value	$0.658 \text{ mg/l} \pm 0.0110$
	Method Blank < 0.05 mg/l
TS Lead Technician: Mike Apple	ŭ

S.G. Lawry

Environmental Specialist

President, LTS

Environmental and Analytical Services-Since 1994 California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: August 13, 2014
Laboratory Number: 142040

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On August 7, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142040-01
UNICEL OUT	142040-02*
UNICEL OUT	142040-03*
UNICEL OUT	142040-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.



Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 08/06/14 CAS LAB NO: 142040 Date Received: 08/07/14

Analyst: GM Date Analyzed: 08/11/14

Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142040-01	Unicel Out	12	1	1	5

QUALITY CONTROL DATA

142040-MB Method Blank ND 1 1 5

Chain of Custody

LTS	Environm	ental, Inc.	Report t	FM O&G	s c/o S. Lawry			Bill to:	Accounts	Payable	,
704	Adirondac	k Avenue							700 Milam S	te 3100	8/14
Ve	entura, CA	93003							Houston, TX		
	805-644-4										8/15
FACILITY:		Hermosa					SUBMITTED T	'O:	Capco Analy	rtical Servi	ces
COLLECTOR	₹:	LTS					REPORT TO:			PHONE:	
PROJECT/CI	HARGE#	Weekly NPD	ES				COPIES TO:		Supervisor	PHONE:	644-4560
RESULTS RI	EQUIRED:	Normal					4		Broadway,	PHONE:	
RESULTS B	Y: PHONE:	·	FAX:		-			Orcutt, C			
				**		Ģi		Ruth Juris			
SAMPLE	SAMPLE	ID/LOCATION	GRAB/	VOLUME	DATE/TIME	Pre-		ANALYSE	S REQUESTED	(METHOD)	
NO.			COMP.		COLLECTED	serv					
1	Un	icel out	grab	1	Date: 8/6/14	HCI	EPA 1664	Abs (12)	IR (14)		İ
					Time: 1600						
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		/		ļ	1615						
3	/		grab	1							1
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Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: August 20, 2014

Laboratory Number: 142082

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On August 13, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142082-01
UNICEL OUT	142082-02*
UNICEL OUT	142082-03*
UNICEL OUT	142082-04*
UNICEL OUT	142082-02* 142082-03*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT

Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.



Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 08/11/14

CAS LAB NO: 142082

Date Received: 08/13/14 Analyst: GM Date Analyzed: 08/14/14

Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample ID		MDL (mg/L)	
142082-01	Unicel Out	1		5

QUALITY CONTROL DATA

142082-MB Method Blank ND 1 1 5

Chain of Custody

704 A Ve	Environme Adirondaci ntura, CA	k Avenue 93003	Report t	FM O&G	S s c/o S. Lawry			Bill to: Accounts 700 Milam Houston, T	Ste 3100 X, 77002
FACILITY: COLLECTOR PROJECT/CH RESULTS RE RESULTS BY	HARGE # EQUIRED:	Hermosa LTS Weekly NPD Normal	DES FAX:			e e e e		Elatform Supervisor 201 S. Broadway, Orcutt, CA 93455 Ruth Juris	PHONE: 644-4560 PHONE:
SAMPLE NO.	SAMPLE	ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-		ANALYSES REQUESTED	(METHOD)
1	Un	nicel out	grab	1	Date: 8/11/14 Time: 1200	HCI	EPA 1664 A	bs (9) IR (10)	50
2			grab	1	1230	1	Abs (12) IR	(14)	
3	/		grab	1	1300			2	8
4			grab	1	1330	02 a •		р	
	(6)		y in				8	Field notes	2
							130 p	ppm field te	st. (sufides)
	_								Ж
Comments:	Run #1. H	lold rest.							
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Relinquished I	by:		27%	Date: Time:	***************************************	Relinquis Received			Date:



Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: August 27, 2014 Laboratory Number: 142166

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On August 22, 2014, Capco Analytical Services, Inc. (CAS), received four (4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142166-01
UNICEL OUT	142166-02*
UNICEL OUT	142166-03*
UNICEL OUT	142166-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt Ruth Juris @-EDT Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.



Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 08/21/14

CAS LAB NO: 142166

Date Received: 08/22/14 Date Analyzed: 08/25/14 Analyst: GM

Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
	4				
142166-01	Unicel Out	10	1 9	1	₂ 5

QUALITY CONTROL DATA

142166-MB Method Blank ND

Chain of Custody

704 <i>A</i> Ve	Environmental, Inc. Adirondack Avenue ntura, CA 93003	Report	FM O&G	S s c/o S. Lawry			Bill to:	Accounts 700 Milam S Houston, TX	Ste 3100	8/29
FACILITY: COLLECTOR PROJECT/CI RESULTS RE RESULTS B	HARGE # Weekly NP EQUIRED: Normal	DES FAX:				SUBMITTED T REPORT TO: COPIES TO:	Platform		PHONE:	644-4560
SAMPLE	SAMPLE ID/LOCATION	GRAB/	VOLUME	DATE/TIME	Pre-		ANALYSE	S REQUESTED	(METHOD)	
NO. 1	Unicel out	grab	1	Date: 8/21/14 Time: 815	HCI	EPA 1664	Abs (10)	IR (12)		
2		grab	1	845	ì	,e				
3		grab	1	915				<u> </u>		
4	*	grab	1	945	+					
						22K H2S. 1 1400 IR (11)		es d sulfides test		
Comments:	Run #1. Hold rest.									
Relinquished I Received by:	by:		Date:	8-22-14	Relinquis				Date:	
. woodeau by.		my)	Time:	1505	Receive	d by:		···	Time:	
Relinquished I	ру:		Date:		Relinquis	shed by:			Date:	
Received by:			Time:		Received	d by:			Time:	



Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: September 3, 2014

Laboratory Number: 142204

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On August 28, 2014, Capco Analytical Services, Inc. (CAS), received four (4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION CAS LAB NUMBER	EK ID
U. OUT 142204-01	
U. OUT 142204-02*	
U. OUT 142204-03*	
U. OUT 142204-04*	

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D. Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.



Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 08/26/14

CAS LAB NO: 142204

Date Received: 08/28/14

Analyst: GM Date Analyzed: 09/02/14 Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)		MDL (mg/L)	
142204-01	U. Out	11	1	1.	

QUALITY CONTROL DATA

142204-MB Method Blank ND 1 1 5

Chain of Custody

704 Ac Ven	nvironme dirondack ntura, CA 805-644-48	Avenue 93003	Report t	FM O&G	s c/o S. Lawry		Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002
FACILITY: COLLECTOR: PROJECT/CH. RESULTS REC RESULTS BY	ARGE#	Weekly NPD Normal	Henmose DES FAX:	3			SUBMITTED TO: Capco Analytical Services REPORT TO: PHONE: 644-4560 COPIES TO: Platform Supervisor PHONE: 644-4560 201 S. Broadway, PHONE: 9/4 Orcutt, CA 93455 Ruth Juris 9/4
SAMPLE	SAMPLE	ID/LOCATION	GRAB/	VOLUME	DATE/TIME	Pre-	
NO. 1	U. 00	y 	grab	1	COLLECTED Date: 8-26-14 Time: 1900	serv ACI	EPA 1664 Abs (4) IR(9)~
2	···	/	grab	1	1930		2
3			grab	1 8	2000		
4	×	a .	grab	1	2030	*	t took -
	×		8				Field notes
				£ k			
	#			2		#() ()	8-9 005, down to () ESP. Somple point flow took up to
ā			Ú.		9	10	Sminutes per sample to fill.
Comments:	Run #1. H	old rest.	(4)				
Relinquished b Received by:	by:		and a	Date:		Relinqui Receive	uished by: Date: 428/ Time:
Relinquished b Received by:	oy:		•	Date:		Relinqui Receive	uished by: Date: Time:



Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: September 11, 2014

Laboratory Number: 142282

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On September 5, 2014, Capco Analytical Services, Inc. (CAS), received four (4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142282-01
UNICEL OUT	142282-02*
UNICEL OUT	142282-03*
UNICEL OUT	142282-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT

Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.



Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 09/02/14

CAS LAB NO: 142282

Date Received: 09/05/14 Analyst: GM Date Analyzed: 09/09/14

Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	-		RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
	Unicel Out	ė		1	1	5

QUALITY CONTROL DATA

142282-MB Method Blank 1 ND 1 5

Chain of Custody

704 A Ve	Environmo Adirondaci ntura, CA	k Avenue 93003	Report 1	FM O&G	is c/o S. Lawry		***************************************	Bill to: Accounts 700 Milam S Houston, TX	te 3100
FACILITY: COLLECTOR PROJECT/CH RESULTS RE RESULTS BY	HARGE # EQUIRED:		Herm TS ES	05a		**	SUBMITTED TO REPORT TO: COPIES TO:	O: Capco Analy Platform Supervisor 201 S. Broadway, Orcutt, 'CA 93455 Ruth Juris	PHONE: 644-4560 PHONE: 9/12-
SAMPLE NO.	SAMPLE	ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre-	8.9%	ANALYSES REQUESTED (
1	Unic	el out	grab	1	Date: 9-2 - 14 Time: 1900	HCI	EPA 1664	Abs (10) 1R	(B)
2		· /	grab	1	1930		**		*:
3		/	grab	1	2000		4.	12	202 27
4	8	×	grab	1	2030	1			3 8
80	29-50-00	#) 2							
					99,8		ā Se	Field notes	
	# E	ij.		23.5	20		27	K (H25)	8 ,
* *	*	950	**				#		
Comments:	Dun #4 L	old root			Х				
Comments:	Run #1. H	old rest.						4	100
Relinquished I	b y :				95.14		shed by:		Date:
55	100 100) inite.	1003	Receive	a by:		Time:
Relinquished t Received by:	by:			Date:			shed by:		Date:
				THIE.	2.3	Receive	u vy: -		Time:

Environmental and Analytical Services-Since 1994 California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: September 16, 2014

Laboratory Number: 142330

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On September 11, 2014, Capco Analytical Services, Inc. (CAS), received four (4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142330-01
UNICEL OUT	142330-02*
UNICEL OUT	142330-03*
UNICEL OUT	142330-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt Ruth Juris @-EDT Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.



Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 09/08/14

CAS LAB NO: 142330

Date Received: 09/11/14
Date Analyzed: 09/15/14

Analyst: GM

Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample	ID	RESULTS (mg/L)		MDL (mg/L)	PQL (mg/L)
142330-01	Unicel	Out		1.		5

QUALITY CONTROL DATA

142330-MB Method Blank ND 1 1 5

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560	Report t	FM O&G	s s c/o S. Lawry			Bill to: Accounts 700 Milam S Houston, TX	te 3100
FACILITY:	Hermose 475 ES FAX:	2			SUBMITTED TO REPORT TO: COPIES TO:	Platform Supervisor 201 S. Broadway, Orcutt, CA 93455 Ruth Juris	rtical Services PHONE: 644-4560 PHONE: 9 18 9 19
SAMPLE SAMPLE ID/LOCATION	GRAB/	VOLUME	DATE/TIME :	Pre-		ANALYSES REQUESTED (· · · · · · · · · · · · · · · · · · ·
NO. 1 Unicelout	grab	1	Date: 9.8.14 Time: 20.00	serv HC/	EPA 1664	Abs (12) 1	R(14)
2	grab	1	2015	1			
3	grab	1	2030				
4	grab	1	2045	1		þ	
*				9			
						Field notes	ş.
			to the second se		-		
		 .				34	
			m ₃ .		•	1.0	
Comments: Run #1. Hold rest.		\$)					
Relinquished by: Received by:		Date: Time:	9·11. 14 845	Relinquis Received		end 6	Date: 69/1/14 Time:
Relinquished by: Received by:		Date: Time:		Relinquis			Date:

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: September 24, 2014

Laboratory Number: 142387

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On September 18, 2014, Capco Analytical Services, Inc. (CAS), received four (4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID					
UNICEL OUT	142387-01					
UNICEL OUT	142387-01*					
UNICEL OUT	142387-03*					
UNICEL OUT	142387-04*					

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D. Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

704 Adi		ntal, Inc. Avenue	Report to	FM O&G	s c/o S. Lawry			Bill to:	Accounts 700 Milam S Houston, TX	Ste 3100	
	11a, OA 15-644-45						***				
ACILITY:	0-0-1-10	Hermosa	_				SUBMITTED TO) :	Capco Analy	tical Services	
OLLECTOR:		LTS			-		REPORT TO:			PHONE:	
ROJECT/CHAF	RGE#	Weekly NPD	ES		*		COPIES TO:	Platform	Supervisor	PHONE: 64	4-4560
ESULTS REQU		Normal					,	201 S. E	Broadway,	PHONE:	
ESULTS BY: I			FAX:				•	Orcutt, CA	93455	9/25	-/.
			(10)		-			Ruth Juris		7/29	9/26
SAMPLE	SAMPLE	ID/LOCATION	GRAB/	VOLUME	DATE/TIME	Pre-		ANALYSE	REQUESTED	(METHOD)	
NO.			COMP.		COLLECTED	serv				<u> </u>	
1	Uni	cel out	grab	1	Date: 9/17/14 Time: 1200	HCI	EPA 1664	Abs (13)	IR (15)		139
2			grab	1	1215		40	2			
3			grab	1	1230			×			
4	×		grab	1	1245	+			Ē,		
		Œ	3.5		¥ .			,	d		
				## 12				Field note	98		
							V-97 IR (26). 20 k H2S	See other	chain.		
									\$ 1		
		•			4			50			
omments: R	un #1. H	old rest.							S		
Set.				87 - 6			<u>r. </u>	0			
elinquished by: eceived by:		- Con			9-18-14	Relinquis Received	shed by:	-		Date:	/\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
elinquished by:				Date		Relinqui		4	10.	Date:	
eceived by:				Time:	1-2	Received	d been		· 	Time:	



Environmental and Analytical Services-Since 1994 California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS Environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: September 24, 2014

Laboratory Number: 142406

Project Name: Platform Hermosa Produced Water Well Sampling

Sampled By: Client

9/18

BSEE Duplicates

On September 19, 2014, Capco Analytical Services, Inc.(CAS), received five(5) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER	ID
NPDES DIFFUSER	142406-01	
NPDES DIFFUSER	142406-02	
NPDES DIFFUSER	142406-03	*
NPDES DIFFUSER	142406-04	
NPDES DISSUSER	142406-05	*00

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa Supervisor @-Orcutt

Ruth Juris-EDT Mike Apple-EDT

Note: S-VOC's analysis results will be available 9/26/14.

If you have any further questions or concerns, please contact me at your convenience. This report consists of 5 pages excluding the cover letter and the Chain of Custody.



Environmental and Analytical Services-Since 1994

Client:

Freeport-McMoran O&G (Hermosa)

Date Sampled:

09/18/14

Matrix:

WATER

Date Received:

09/19/14

Analyst:

an

Date Analyzed:

09/23/14

Analyst:	GP	09/23/14				
Compound	Results ug/L	BENZENE EPA METHOD 602 Dilution Factor	MDL ug/L	PQL ug/L	Surrogate †Recovery	
CAS Lab # : Client ID :	MB-092214 METHOD BLANK BQL	09/22/14 1	0.2	1.0	92 8	
CAS Lab # : Client ID :	142406 NPDES PROD. WATER 900	-01 R 09/23/14 50	10	100	88%	

142406-05

Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

1

20

CERTIFICATE OF ANALYSIS

Client: Freeport McMoRan CAS LAB NO: 142406 Analyst: ABE		(PF Hermosa)	Date Re	ecelved:	09/18/14 09/19/14 09/22/14 Water
	**************************************	TOTAL COPPER EPA Method 200.7			
CAS Lab #	Sample ID	RESULTS {µg/L}	Dilution Factor	PQL (µg/L)	MDL (µg/L)

ND

QUALITY CONTROL SECTION

NPDES Diffuser

142406-MB Method Blank ND 1 20 4

0.04



CERTIFICATE OF ANALYSIS

Client: Freeport McMoRan (PF Hermosa)

160

Date Sampled: 09/18/14

CAS LAB NO: 142405

Date Received: 09/19/14

Analyst: AN/GM

Total Sulfide

Sample Matrix: Water

4500S⁻²F

09/22/14

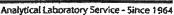
WET	CHEMI	STRY	SIII	WMARY

	*****	CILLINI	TIVE D	OMMAKI	-		
COMPOUND	RESULTS	UNITS	DF	PQL	MDL	METHOD	ANALYZED
CAS Lab#: 14240 Sample ID: NPDE			a a				
Oil & Grease	64	mg/L	1	5.0	1.0	1664	09/22/14
CAS Lab#: 14240 Sample ID: NPDE							

1

0.2

mg/L





Client: Capco Analytical Services

1536 Eastman Avenue

Ventura CA, 93003

Report Date:

09/30/14 14:45

Received Date:

09/23/14 09:50

Turn Around:

3 workdays

Client Project:

Weck Lab 142406

Phone:

Attention: Dr. Keith Chang (805) 644-1095

Fax:

(805) 644-9947

Work Order(s):

4123002

PO Number:

715381

NELAP #04229CA ELAP#1132 NEVADA #CA211 HAWAN LACSD #10143

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. Weck Laboratories, Inc. certifies that the test results meet all NELAC requirements unless noted in the case narrative. This analytical report is confidential and is only intended for the use of Weck Laboratories, Inc. and its client. This report contains the Chain of Custody document, which is an integral part of it, and can only be reproduced in full with the authorization of Weck Laboratories, Inc.

Dear Dr. Keith Chang:

Enclosed are the results of analyses for samples received 09/23/14 09:50 with the Chain of Custody document. The samples were received in good condition, at 7.8 °C and on ice. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Case Narrative:

Reviewed by:

Kim G Tu **Project Manager**







WECK LABORATORIES, INC.

Analytical Laboratory Service - Since 1964

Capco Analytical Services 1536 Eastman Avenue Ventura CA, 93003 Date Received:

Date Reported:

09/23/14 09:50 09/30/14 14:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID

Sampled by:

Sample Comments

Lab ID

Matrix

Date Sampled

142406-02

Client

4123002-01

Water

09/18/14 14:39

ANALYSES

Acid and Base/Neutral Extractables by EPA Method 625





Sampled: 09/18/14 14:39

Analytical Laboratory Service - Since 1964

Date Received:

09/23/14 09:50

Date Reported:

09/30/14 14:45

4123002-01

142406-02

Sampled By: Client

Matrix: Water

Acid and Base/Neutral Extractables by EPA Method 625

Method: EPA 625	Batch: W4I1158	Prepare	d: 09/23/14 0	9:09	Analyst Armando Bielma			
Analyte	Result	MDL	MRL	Units	Dil	Analyzed	Qualifier	
Benzo (a) anthracene	ND	3.8	20	ug/l	20	09/24/14 17:35	M-04	
Benzo (a) pyrene	ND	2.6	20	ug/l	20	09/24/14 17:35	M-04	
Benzo (b) fluoranthene	ND	2.8	20	ug/l	20	09/24/14 17:35	M-04	
Benzo (k) fluoranthene	NĐ	4.4	20	ug/l	20	09/24/14 17:35	M-04	
Chrysene	ND	-3.8	20	ug/i	20	09/24/14 17:35	M-04	
Dibenzo (a,h) anthracene	ND	1.6	40	ug/I	20	09/24/14 17:35	M-04	
Surr: 2,4,6-Tribromophenol	19 %	Conc:9.40	25-102	%			M-04, S-GC	
Surr: 2-Fluorobiphenyl	62 %	Conc: 15.4	22-107	%			M-04	
Surr: 2-Fluorophenol	46 %	Conc:22.8	3-74	%			M-04	
Surr: Nitrobenzene-d5	74 %	Conc:18.6	27-111	%			M-04	
Surr: Phenol-d5	45 %	Conc:22.6	0.1-53	%			M-04	
Surr: Terphenyl-d14	53 %	Conc:13.2	28-113	%			M-04	



QUALITY CONTROL SECTION

1.0

1564

09/22/14



Oil & Grease

Total Sulfide

ND

ND

QUALITY CONTROL SECTION

Sample ID: Me CAS LAB NO: :						Anal	yst:	AN/GM
· · · · · · · · · · · · · · · · · · ·		WET CHEMI	STRY SI	JNKARY				
CPMPOUND	RESULTS	UNITS	DF	PQL	MDL	METHOD	AN.	ALYZED
	:			======			====	=====

mg/L 0.2 4500S-2F 1 0.04 09/22/14

1

5.0

mg/L

DF: Dilution Factor

mg/L: Milligrams/Liter(ppm)
ND: Not Detected or <MDL





Analytical Laboratory Service - Since 1964

Date Received: Date Reported: 09/23/14 09:50 09/30/14 14:45

QUALITY CONTROL SECTION



Analytical Laboratory Service - Since 1964

Date Received:

09/23/14 09:50 09/30/14 14:45

Date Reported:

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Batch W4I1158 - EPA 625

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W4I1158-BLK1)				A	nalyzed: (15:09				
1,2,4-Trichlorobenzene	ND	0.55	1.0	ug/l							
1,2-Dichlorobenzene	ND	0.57	1.0	ug/i							
1,2-Diphenylhydrazine/Azobenzene	ND	0.25	1.0	ug/l							
1,3-Dichlorobenzene	ND	0.53	1.0	ug/l							•
1,4-Dichlorobenzene	ND	0.55	1.0	ug/l							
2,4,6-Trichlorophenol	ND	0.22	1.0	ug/l							
2,4-Dichlorophenol	MD	0.26	1.0	ugh							
2,4-Dimethylphenol	ND	0.30	1.0	ug/l							
2,4-Dinitrophenol	ND	1.6	10	ug/l							
2,4-Dinitrotoluene	ND	0.18	1.0	ug/l							
2,6-Dinitrotoluene	ND	0.27	1.0	ug/l							
2-Chloronaphthalene	ND	0.45	1.0	ug/l							
2-Chiorophenol	ND	0.28	1.0	ug/l				141			
2-Methyl-4,6-dinitrophenol	ND	1.7	5.0	ug/l							
2-Nitrophenol	ND	0.26	1.0	ug/I				5			
3,3'-Dichlorobenzidine	ND	1.2	5.0	ug/l							
4,6-Dinitro-2-methylphenol	ND	1.7	5.0	ug/l							
4-Bromophenyl phenyl ether	ND	0.36	1.0	ug/l							
4-Chloro-3-methylphenol	ND	0.23	1.0	ug/I							
4-Chlorophenyl phenyl ether	ND	0.41	1.0	ug/l							
4-Nitrophenol	ND	0.45	5.0	ug/l							
Acenaphthene	ND	0.38	1.0	ug/l							
Acenaphthylene	ND	0.40	1.0	ug/l							
Anthracene	- ND	0.34	1.0	ug/l							
Benzidine	ND	3.7	10	ug/l							
Benzo (a) anthracene	ND	0.19	1,0	ug/l							
Benzo (a) pyrene	ND	0.13	1.0	ug/l							
Benzo (b) fluoranthene	ND	0.14	1.0	ug/i							
Benzo (g,h,i) perylene	ND	0.10	2.0	ug/l							
Benzo (k) fluoranthene	ND	0.22	1.0	ug/i							
Benzyl butyl phthalate	ND	0.18	1.0	ug/l							
Bis(2-chloroethoxy)methane	ND	0.25	1.0	ug/i							
Bis(2-chloroethyl)ether	ND	0.27	1.0	ug/i							
Bis(2-chloroisopropyl)ether	ND	0.38	1.0	ug/l							
Bis(2-ethylhexyl)phthalate	ND	2.3	5.0	ug/i							
Butyi benzyi phthalate	ND	0.18	1.0	ug/I							
Chrysene	ND	0.19	1.0	ug/l							
Dibenzo (a,h) anthracene	ND	0.080	2.0	ug/l							
Diethyl phthalate	ND	0.15	1.0	ug/l							



Analytical Laboratory Service - Since 1964

Date Received:

09/23/14 09:50

Date Reported:

09/30/14 14:45

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Datah	W411158 .	
Ballin	TVGITION :	• CF4 DZ3

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W4I1158-BLK1)					Analyzed: (09/24/14	15:09				
Dimethyl phthalate	ND	0.18	1.0	ug/l				14			
Di-n-butyl phthalate	ND	0.24	1.0	ug/l							
Di-n-octyl phthalate	ND	0.19	1.0	ug/l						10	
Fluoranthene	ND	0.22	1.0	ug/l							
Fluorene	ND	0.35	1.0	ug/i							
Hexachlorobenzene	ND	0.49	1.0	ug/l							
Hexachlorobutadiene	ND	0.47	1.0	ug/l							
Hexachlorocyclopentadiene	ND	1.5	5.0	ug/l							
Hexachloroethane	ND	0.52	1.0	ug/i							
Indeno (1,2,3-cd) pyrene	ND	0.12	2.0	ug/l							
Isophorone	ND	0.21	1.0	ug/l							
Naphthalene	ND	0.49	1.0	ug/l							
Nitrobenzene	ND	0.36	1.0	ug/l							
N-Nitrosodimethylamine	ND	0.14	1.0	ug/t							
N-Nitrosodi-n-propylamine	ND	0.26	1.0	ug/i							
N-Nitrosodiphenylamine	ND	0.19	1.0	ug/l				9			
Pentachlorophenol	ND	0.19	1.0	ug/l							
Phenanthrene	ND	0.32	1.0	ug/l							
Phenol	ND	0.16	1.0	ug/l							
Pyrene	ND	0.25	1.0	ug/l							
Surr: 2,4,6-Tribromophenol	42.5			ug/l	50.0		85	25-102			
Surr: 2-Fluorobiphenyl	20.7			ug/l	25.0		83	22-107			
Sur: 2-Fluorophenol	26.1			ug/l	50.0		52	3-74			
Surr. Nitrobenzene-d5	18.7			ug/l	25.0		75	27-111			
Sur: Phenol-d5	16.5			ug/l	50.0		33	0.1-53			
Surr: Terphenyl-d14 LCS (W4I1158-BS1)	21.5			ug/l	25.0	00/04/44	86	28-113			
1,2,4-Trichlorobenzene	15.6	0.55	1.0		nalyzed: 0 25.0	19124114		44-142			
1,2-Dichlorobenzene	15.4	0.57	1.0	ug/i	25.0 25.0		62 62	32-129			
1,3-Dichlorobenzene	14.4	0.57	1.0	ug/i	25.0 25.0		58	0.1-172			48
1,4-Dichlorobenzene	16.5	0.55	1.0	ug/l	25.0		66	20-124			
2,4,6-Trichlorophenol	18.9	0.22	1.0	ug/l							
2,4-Dichlorophenol	18.3	0.26	1.0	ug/l	25.0		75	37-144			
				ug/l	25.0		73	39-135			
2,4-Dimethylphenol	14.8	0.30	1.0	ug/l	25.0		59	32-119			2
2,4-Dinitrophenol	18.3	1.6	10	ug/i	25.0		73	0.1-191			090
2,4-Dinitrotoluene	20.8	0.18	1.0	ug/l	25.0		83	39-139			**
2,6-Dinitrotoluene	18.4	0.27	1.0	ug/l	25.0		73	50-158			020
2-Chloronaphthalene	19.7	0.45	1.0	ugЛ	25.0		79	60-118			
2-Chlorophenol	14.2	0.28	1.0	ບ໘/ໂ	25.0		57	23-134			
2-Methyl-4,6-dinitrophenol	20.1	1.7	5.0	ug/l	25.0		80	0.1-181			



Analytical Laboratory Service - Since 1964



09/23/14 09:50

Date Reported:

09/30/14 14:45

Capco Analytical Services 1536 Eastman Avenue Ventura CA, 93003

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Batch W4I1158 - EPA 625

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS (W411158-BS1)				- 4	Analyzed:	09/24/14	15:39				
2-Nitrophenol	16.3	0.26	1.0	ug/l	25.0		65	29-182			
3,3'-Dichlorobenzidine	20.5	1.2	5.0	ug/l	25.0		82	0.1-262			
4,6-Dinitro-2-methylphenol	20.1	1.7	5.0	ug/l	25.0		80	0.1-181			
4-Bromophenyl phenyl ether	16.6	0.36	1.0	ug/l	25.0		66	53-127			
4-Chloro-3-methylphenol	14.5	0.23	1.0	ug/l	25.0		58	22-147			
4-Chlorophenyl phenyl ether	20.3	0.41	1.0	ug/l	25.0		81	25-158			
4-Nitrophenol	8.66	0.45	5.0	Ngu	25.0		35	0.1-132			
Acenaphthene	22.0	0.38	1.0	ug/I	25.0		88	47-145			
Acenaphthylene	22,3	0.40	1.0	ug/l	25.0		89	33-145			
Anthracene	21.6	0.34	1.0	ug/I	25.0		86	27-133			
Benzo (a) anthracene	21.9	0.19	1.0	ug/l	25.0		88	33-143			
Benzo (a) pyrene	24.4	0.13	1.0	ug/l	25.0		98	17-163			
Benzo (b) fluoranthene	24.0	0.14	1.0	ug/I	25.0		96	24-159			
Benzo (g,h,i) perylene	29.8	0.10	2.0	ug/i	25.0		119	0.1-219			
Benzo (k) fluoranthene	25.1	0.22	1.0	ug/l	25.0	*	100	11-162			
Benzyl butyl phthatate	24.3	0.18	1.0	ug/I	25.0		97	0.1-152			
Bis(2-chloroethoxy)methane	18.6	0.25	1.0	ug/l	25.0		74	33-184			
Bis(2-chloroethyl)ether	17.4	0.27	1.0	ug/l	25.0		70	12-158			
Bis(2-chloroisopropyl)ether	17.8	0.38	1.0	ug/l	25.0		71	36-166			
Bis(2-ethylhexyl)phthalate	18.9	2.3	5.0	ug/l	25.0		76	8-158			
Butyl benzyl phthalate	24.3	0.18	1.0	ug/l	25.0		97	0.1-152			
Chrysene	21.8	0.19	1.0	ug/l	25.0		87	17-168			44
Dibenzo (a,h) anthracene	26.5	0.080	2.0	ug/l	25.0		106	0.1-227			
Diethyl phthalate	21.2	0.15	1.0	ug/l	25.0		85	0.1-114			
Dimethyl phthalate	22.1	0.18	1.0	ug/l	25.0		88	0.1-112			
Di-n-butyl phthalate	26.6	0.24	1.0	ug/l	25.0		106	1-118			
Di-n-octyl phthalate	27.4	0.19	1.0	ug/l	25.0		110	4-146			
Fluoranthene	22.4	0.22	1.0	ug/l	25.0		90	26-137			
Fluorene	22.5	0.35	1.0	ug/l	25.0		90	59-121			
Hexachlorobenzene	19.2	0.49	1.0	ug/l	25.0		77	0.1-152			
Hexachlorobutadiene	17.2	0.47	1.0	ug/l	25.0		69	24-116			
Hexachlorocyclopentadiene	11.9	1.5	5.0	ug/l	25.0		48	0.1-81			
Hexachioroethane	14,2	0.52	1.0	ug/l	25.0		57	40-113			
Indeno (1,2,3-cd) pyrene	25.2	0.12	2.0	ug/l	25.0		101	0.1-171			000
Isophorone	17.5	0.21	1.0	ug/l	25.0		70	21-196			
Naphthalene	19.6	0.49	1.0	ug/l	25.0		78	21-133			
Nitrobenzene	16.8	0.36	1.0	ug/l	25.0		67	35-180			
N-Nitrosodimethylamine	11.0	0.14	1.0	ug/i	25.0		44	15-59			
N-Nitrosodi-n-propylamine	18.0	0.26	1.0	ug/l	25.0		72	0.1-230			

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Analytical Laboratory Service - Since 1964

Date Received:

09/23/14 09:50

Date Reported:

09/30/14 14:45

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Batch W4I1158 - EPA 625

Analyte	Result	MDL	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS (W4i1158-BS1)				Α	nalyzed: (9/24/14	15:39	5555 [7]		9.56	
N-Nitrosodiphenylamine	16.6	0.19	1.0	ug/l	25.0		67	42-90	ni-cott-		
Pentachlorophenol	21.7	0.19	1.0	ug/l	25.0		87	14-176			
Phenanthrene	22.7	0.32	1.0	ug/l	25.0		91	54-120			
Phenol	7.05	0.16	1.0	ug/l	25.0		28	5-112			
Pyrene	23.0	0.25	1.0	ug/i	25.0		92	52-115			
Surr: 2,4,6-Tribromophenol	37.0			ug/l	50.0		74	25-102			
Surr: 2-Fluorobiphenyl	20.5	*		ug/I	25.0		82	22-107			
Surr: 2-Fluorophenoi	21.8			ug/l	50.0		44	3-74			
Surr: Nitrobenzene-d5	16.4			ug/t	25.0		66	27-111			
Surr: Phenol-d5	14.6			ug/f	50.0		29	0.1-53			
Surr: Terphenyl-d14	19.8			ug/i	25.0		79	28-113			
LCS Dup (W4I1158-BSD1)		-		A	nalyzed: (9/24/14	16:08				
1,2,4-Trichlorobenzene	16.2	0.55	1.0	ug/I	25.0		65	44-142	4	30	
1,2-Dichlorobenzene	16.5	0.57	1.0	ug/l	25.0	9)	66	32-129	6	30	20 14
1,3-Dichlorobenzene	15.4	0.53	1.0	ug/l	25.0		62	0.1-172	7	30	
1,4-Dichlorobenzene	17.3	0.55	1.0	ug/i	25.0	1	69	20-124	.5	30	
2,4,6-Trichlorophenol	18.6	0.22	1.0	ug/ī	25.0	14	74	37-144	1	30	
2,4-Dichlorophenol	18.3	0.26	1.0	ug/l	25.0	- 1	73	39-135	0.05	30	
2,4-Dimethylphenol	15.9	0.30	1.0	ug/l	25.0	277	63	32-119	7	30	
2,4-Dinitrophenol	19.8	1.6	10	ug/l	25.0		79	0.1-191	8	30	
2,4-Dinitrotoluene	22.8	0.18	1.0	ug/l	25.0		91	39-139	9	30	
2,6-Dinitrotoluene	19.9	0.27	1.0	ug/l	25.0		80	50-158	8	30	
2-Chloronaphthalene	20.2	0.45	1.0	ug/l	25.0		81	60-118	3	30	
2-Chlorophenol	15.2	0.28	1.0	ug/l	25.0		61	23-134	7	30	
2-Methyl-4,6-dinitrophenol	21.9	1.7	5.0	ug/l	25.0		88	0.1-181	9	30	
2-Nitrophenol	17.4	0.26	1.0	ug/i	25.0		70	29-182	6	30	
3,3'-Dichlorobenzidine	23.1	1.2	5.0	ug/i	25.0		92	0.1-262	12	30	
4,6-Dinitro-2-methylphenol	21.9	1.7	5.0	ug/l	25.0	17	88	0.1-181	9	30	
4-Bromophenyl phenyl ether	17.1	0.36	1.0	ug/l	25.0		68	53-127	3	30	
4-Chloro-3-methylphenol	14,8	0.23	1.0	ug/l	25.0		59	22-147	2	30	
4-Chlorophenyl phenyl ether	20.6	0.41	1.0	ug/l	25.0		82	25-158	1	30	
4-Nitrophenol	9.45	0.45	5.0	ug/i	25.0		38	0.1-132	9	30	
Acenaphthene	22.4	0.38	1.0	_	25.0		89	47-145	2.		
·				ug/l			4			30	
Acenaphthylene	22.8	0.40	1.0	ug/l	25.0		91	33-145	2	30	
Anthracene	22.0	0.34	1.0	ug/l	25.0		88	27-133	2	30	
Benzo (a) anthracene	23.3	0.19	1.0	ug/l	25.0		93	33-143	6	30	
Benzo (a) pyrene	27.3	0.13	1.0	ug/i	25.0		109	17-163	11	30	
Benzo (b) fluoranthene	29.5	0.14	1.0	ug/l	25.0		118	24-159	21	30	
Benzo (g,h,i) perylene	31.1	0.10	2.0	ug/l	25.0		124	0.1-219	4	30	
Benzo (k) fluoranthene	24.2	0.22	1.0	ug/l	25.0		97	11-162	4	30	



Analytical Laboratory Service - Since 1964

Date Received:

09/23/14 09:50

Date Reported:

09/30/14 14:45

Acid and Base/Neutral Extractables by EPA Method 625 - Quality Control

Batch W4I1158 - EPA 625

Analyte	Result	MDL.	MRL	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS Dup (W4I1158-BSD1)				A	malyzed: (09/24/14	6:08				
Benzyl butyl phthalate	25.8	0.18	1.0	ug/l	25.0		103	0.1-152	6	30	
Bis(2-chloroethoxy)methane	19.2	0.25	1.0	ug/l	25.0		77	33-184	- 4	30	
Bis(2-chloroethyl)ether	18.1	0.27	1.0	ug/l	25.0		72	12-158	-4	30	
Bis(2-chloroisopropyl)ether	18.2	0.38	1.0	ug/I	25.0		73	36-166	2	30	
Bis(2-ethylhexyl)phthalate	21.4	2.3	5.0	ug/l	25.0		86	8-158	13	30	
Butyl benzyl phthalate	25.8	0.18	1.0	ug/l	25.0		103	0.1-152	6	30	
Chrysene	22.2	0.19	1.0	ug/l	25.0		89	17-168	2	30	
Dibenzo (a,h) anthracene	26.5	0.080	2.0	ug/f	25.0		106	0.1-227	0.1	30	
Diethyl phthalate	21.8	0.15	1.0	ug/l	25.0		87	0.1-114	3	30	
Dimethyl phthalate	23.1	0.18	1.0	ug/l	25.0		92	0.1-112	5	30	
Di-n-butyl phthalate	28.1	0.24	1.0	ug/l	25.0		112	1-118	5	30	
Di-n-octyl phthalate	30.2	0.19	1.0	ug/l	25.0		121	4-146	10	30	
Fluoranthene	22.9	0.22	1.0	ug/i	25.0		91	26-137	2	30	
Fluorene	22.8	0.35	1.0	ug/I	25.0		91	59-121	. 1	30	
Hexachlorobenzene	19.9	0.49	1.0	ug/i	25.0		80	0.1-152	3	30	
Hexachiorobutadiene	17.8	0.47	1.0	ug/l	25.0		71	24-116	3	30	
Hexachiorocyclopentadiene	13.2	1.5	5.0	Ngu	25.0		53	0.1-81	10	30	
Hexachloroethane	15.5	0.52	1.0	ug/l	25.0		62	40-113	8	30	
Indeno (1,2,3-cd) pyrene	25.3	0.12	2.0	ug/l	25.0		101	0.1-171	0.6	30	
Isophorone	18.0	0.21	1.0	ug/l	25.0		72	21-196	3	30	
Naphthalene	20.1	0.49	1.0	ug/l	25.0		81	21-133	3	30	
Nitrobenzene	17.0	0.36	1.0	ug/l	25.0		68	35-180	1	30	
N-Nitrosodimethylamine	11.7	0.14	1.0	ug/i	25.0		47	15-59	6	30	
N-Nitrosodi-n-propylamine	18.6	0.26	1.0	ug/l	25.0	10	74	0.1-230	4 .	30	
N-Nitrosodiphenylamine	17.4	0.19	1.0	ug/l	25.0		70	42-90	. 5	30	
Pentachlorophenol	22.6	0.19	1.0	.ug/l	25.0		91	14-176	4	30	
Phenanthrene	22.7	0.32	1.0	ug/l	25.0		91	54-120	0.1	30	
Phenol	7.40	0.16	1.0	ug/l	25.0		30	5-112	5	30	
Pyrene	23.8	0.25	1.0	ug/l	25.0		95	52-115	3	30	
Surr: 2,4,6-Tribromophenol	37.8			ug/i	50.0		76	25-102		720	
Surr: 2-Fluorobiphenyl	20.3			ug/l	25.0		81	22-107		75411 S4C	
Surr: 2-Fluorophenol	22.4			ug/l	50.0		45	3-74			
Surr: Nitrobenzene-d5	16.9			ug/l	25.0		68	27-111			
Surr: Phenol-d5	15.2			идЛ	50.0		30	0.1-53			
Sun: Terphenyl-d14	20.3	63		ug/I	25.0		81	28-113			





MRL

Method Reporting Limit

Analytical Laboratory Service - Since 1964

Date Received: Date Reported: 09/23/14 09:50 09/30/14 14:45

Notes and Definitions

S-GC Surrogate recovery outside of control limits due to a possible matrix effect. The data was accepted based on valid recovery of the remaining surrogate. Due to the nature of matrix interferences, sample extract was diluted prior to analysis. The MDL and MRL were raised due to the dilution. MI-04 NOT DETECTED at or above the Reporting Limit. If J-value reported, then NOT DETECTED at or above the Method Detection Limit (MDL) ND Not Reportable NR Dil Dilution dry Sample results reported on a dry weight basis RPD Relative Percent Difference Percent Recovery % Rec Sub Subcontracted analysis, original report available upon request MDL Method Detection Limit Minimum Detectable Activity MDA

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

An Absence of Total Coliform meets the drinking water standards as established by the California Department of Health Services.

The Reporting Limit (RL) is referenced as the Laboratory's Practical Quantitation Limit (PQL) or the Detection Limit for Reporting Purposes (DLR).

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SQP Number MiS002.

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 805-644-4560 Report ti Plains c/o S. Lawry Fig. 1 Report ti Plains c/o S. Lawry 700 Milam Ste Houston, TX, 7	3100
704 Adirondack Avenue 700 Milam Ste Ventura, CA 93003 Houston, TX, 7	3100
Ventura, CA 93003 Houston, TX, 7	
FACILITY: Hermose SUBMITTED TO: Capco Analytic	al Services 9/2.4 PHONE: 644-4560 PHONE: 9/2.9
COLLECTOR: IOSE DIMENTEL	PHONE:
DDA PROMISSION DE LA LA LA LA LA LA LA LA LA LA LA LA LA	PHONE: 644-4560
DECLUTO DECLUDED. Marmet	PHONE:
RESULTS BY: PHONE: FAX: Orcutt, CA 93455	9/29
	, ,
SAMPLE SAMPLE ID/LOCATION GRAB/ VOLUME DATE/TIME Pro- ANALYSES REQUESTED (MET	THOD
NO. COMP. COLLECTED serv	
1 NPDES DEFFUSER grab 1 Date:9-18-14 BSEE WATER SAMPLES FOR TES	TING OF O&G, O&G
Itme:14:30 NA METALS, SULFIDES, VOO'S	1-0V0C/S
2 NPDES DEFFUSER grab 1 Date:9-18-14 BSEE WATER SAMPLES FOR TES	
Time:14:39 N/A METALS; SULFIDES, VOCIS & NPDES DEFFUSER grab 1 Date:9-18-14 RSEE WATER SAMPLES FOR TES	s svoc's Was 3
BULL WATER SAMPLES FOR TES	TING OF GAG, COD (Rangens)
Time:14:42 N/A METALS, SULFIDES, VOC'S &	stiges Quality
4 1 grab 1 Date: 9-18-14 N/A EPA1665 Total Sulf	GOD (BANZANA) GOD (BANZANA) GOD (BANZANA) GOD (BANZANA) GOD (BANZANA) GOD (BANZANA) GOD (BANZANA)
5 grab 1 Date:	1 () () () () () () () ()
Time: 1842 NA EPA1665 COPPET	- BOMAK (MOL)
6 grab 1 Date:	30 1142 - (102)
Time: N/A EPA1665	
7 grab 1 Date:	•
Time: N/A EPA1865	
8 grab 1 Date:	
Time: N/A EPA1665	
9 grab 1 Date:	
Time: N/A EPA1665	
Comments: Time and date each sample as collected. Include a field IR if possible. LTS will preserve.	
A 4 2014	
Relinquished by: Relinquished by:	Date: 04/14
Received by: Received by: Received by:	Time: 8:000 m
3 3	
Relinquished by: Batte: 9 19 Relinquished by:	Date:
Received by:	Time:

Environmental and Analytical Services-Since 1994 California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: September 30, 2014

Laboratory Number: 142443

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On September 25, 2014, Capco Analytical Services, Inc. (CAS), received four (4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142443-01
UNICEL OUT	142443-02*
UNICEL OUT	142443-03*
UNICEL OUT	142443-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT

Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

This report shall not be reproduced except in full without the written approval of CAS. The test results reported represent only the item being tested and may not represent the entire material from which the sample was taken.

Environmental and Analytical Services-Since 1994 California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 09/24/14 Date Received: 09/25/14

CAS LAB NO: 142443

Analyst: GM Date Analyzed: 09/29/14

Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample	ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142443-01	Unicel	Out	20	1	1	5 5

QUALITY CONTROL DATA

142443-MB Method Blank ND

Chain of Custody

LTS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003			Report to	FM O&G	s c/o S. Lawry		3"	Bill to: Accounts 700 Milam Houston, 1	(017. 1
FACILITY: COLLECTOR: PROJECT/CH RESULTS RE RESULTS BY	ARGE# V		ES FAX:	11			SUBMITTED T REPORT TO: COPIES TO:	Platform Supervisor 201 S. Broadway, Orcutt, CA 93455 Ruth Juris	PHONE: 644-4560 PHONE:
SAMPLE	SAMPLE ID	LOCATION	GRAB/	VOLUME	DATE/TIME	Pre-		ANALYSES REQUESTE	D (METHOD)
NO. 1	Unice	lout	grab	្ប	Date: 9-24-14 Time: 1200	HC/	EPA 1664	A65 (17) 11	?(18)
2		/	grab	1"	1300				142443
. 3			grab	1	1400				
4	B		grab	1	1500				7
		WI.			0 9	n e k	8		
35	65 S					3		Field notes	
	Ti.	8.		=	,	# E			
	-	<u>.</u>		'	**************************************				
Comments:	Run #1. Hole	d rest.				11			
			~	-	2	3.5			
Relinquished	by:	(l)		Date:	9.25.18	Relingui	shed by:		Date:
Received by:	ű -	100	Ñ		1520	Receive		<u> </u>	Time:
Relinquished Received by:	by:		17	Date:		Relinqui	ished by:		Date: Time:
						. 1000110	y.		Tillio,



Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: October 3, 2014
Laboratory Number: 142475

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On September 30, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

BEK II	צ
•	
•	
	(BER I) * *

^{*}HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT

Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa) CAS LAB NO: 142475 Date Sampled: 09/29/14

Date Received: 09/30/14 Analyst: GM Date Analyzed: 10/02/14

Sample Matrix: Water

OIL & GREASE ANALYSIS **EPA METHOD 1664**

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142475-01	Unicel Out	13	1	1	5

QUALITY CONTROL DATA

142475-MB Method Blank ND 1 1 5

Chain of Custody

TS Environmental, Inc. 704 Adirondack Avenue Ventura, CA 93003 Report ti FM O&G s c/o S. Law			S s c/o S. Lawry	:	,	Bill to: Accounts Payable 700 Milam Ste 3100 Houston, TX, 77002	
FACILITY: COLLECTOR					: : : :		SUBMITTED TO: Capco Analytical Services REPORT TO: PHONE:
PROJECT/CH RESULTS RE	EQUIRED: Normal						COPIES TO: Platform Supervisor PHONE: 644-4560 201 S. Broadway, PHONE:
RESULTS B	Y: PHONE:	- FAX:		921			Orcutt, CA 93455 Ruth Juris
SAMPLE NO.	SAMPLE ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED		Pre-	ANALYSES REQUESTED (METHOD)
1	Unicelout	grab -	1	Date: 9.29.14 Time: 1600		HCI	EPA 1664 Abs (14) 18(15)
2		grab	1	1415	i		
3		grab	1	1630			
4	K	grab	1	1645	15	4	
	,		1	8.5	520 9	-	
							Field notes
			·	1 000		70	
	×	39					
Comments:	Run #1. Hold rest.				- 1		
Relinquished by:		nds	Date: Time:	9.35.14		elinquis eceived	hed by: Date of Difference of
Relinquished by:	y:	#2	Date: Time:		3.00	elinquis eceived	hed by: Date:by: Time:

Environmental and Analytical Services-Since 1994 California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: October 14, 2014

Laboratory Number: 142566

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On October 8, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142566-01
UNICEL OUT	142566-02*
UNICEL OUT	142566-03*
UNICEL OUT	142566-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt Ruth Juris @-EDT Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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Analyst: GM

CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 10/07/14

CAS LAB NO: 142566 Date

Date Received: 10/08/14
Date Analyzed: 10/10/14

Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample ID		RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
		1			2	
142566-01	Unicel Out		7.6	1	1	5

QUALITY CONTROL DATA

142566-MB Method Blank ND 1 1 5

Chain of Custody

704 Adirondack Avenue Ventura, CA 93003			Report t	Report ti FM O&G s c/o S. Lawry					unts Payable ilam Ste 3100 on, TX, 77002
FACILITY: COLLECTOR:	805-644-4	560 Hermosa LTS	<u>.</u>		÷		SUBMITTED T	o: Capco	Analytical Services 10/16 PHONE:
PROJECT/CH	ARGE#	Weekly NPD Normal	ES	U			COPIES TO:	Platform Supervi	
RESULTS BY		Normal	FAX:	82 X	- W	(/ a)/		Orcutt, CA 93455 Ruth Juris	
SAMPLE NO.	SAMPLE	ID/LOCATION	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre- serv		ANALYSES REQUE	STED (METHOD)
1	Un	icel out	grab	1	Date: 10/7/14 Time: 1600	HCI 	EPA 1664	Abs (09) IR (10)	
2		/	grab	1	1615				142566
3		/	grab	1	1630			2	a ²
4	ĸ	40	grab	. 1	1645	- · ·		V2 32	
							78	To the second	
		08 ==XX					Temp: 175	Field notes	
				·	5(4)		H2S: 26 k	*	
		2					8.9 bac	king in service	
	(n								
Comments:	Run #1. H	lold rest.						it.	
Relinquished t	oy:		V	Date	10-8-14	Relinaui	shed by:		Date:
Received by:	- /			Time	1510	Receive			Time:
Relinquished to	by:	<u> </u>		Date			shed by:		Date:
Received by:				Time		Receive	d by:		Time:



Environmental and Analytical Services-Since 1994 California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: October 23, 2014

Laboratory Number: 142646

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On October 17, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION CAS LAB NUMBER ID

UNICEL OUT 142646-01 UNICEL OUT 142646-02*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt Ruth Juris @-EDT Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 10/15/14

CAS LAB NO: 142646

Date Received: 10/17/14 Analyst: GM Date Analyzed: 10/20/14 Sample Matrix: Water

> OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142646-01	Unicel Out	9.5	1	1	5

QUALITY CONTROL DATA

142646~MB Method Blank ND 1 1 5

Chain of Custody 142646 LTS Environmental, Inc. Report to FM O&G s c/o S. Lawry Bill to: **Accounts Payable** 704 Adirondack Avenue 700 Milam Ste 3100 Ventura, CA 93003 Houston, TX, 77002 805-644-4560 Hermosa Capco Analytical Services FACILITY: SUBMITTED TO: LTS COLLECTOR: REPORT TO: PHONE: Weekly NPDES Platform Supervisor PROJECT/CHARGE # COPIES TO: PHONE: 644-4560 201 S. Broadway, **RESULTS REQUIRED:** Normal PHONE: Orcutt, CA 93455 RESULTS BY: PHONE: FAX: **Ruth Juris** SAMPLE SAMPLE ID/LOCATION ANALYSES REQUESTED (METHOD) GRAB/ VOLUME DATE/TIME Pre-NO. COMP. COLLECTED serv Date: 10/15/14 EPA 1664 Unicel out 1 Ab5 (06) 18(10) grab HCI Time: 1600 1 2 grab HC/ 1600 duplicate Field notes Run #1. Hold rest. Comments: Date: 10.17.14 Relinquished by: Date: Relinquished by: Time: 1050 Received by: Time: Received by: Date: Relinquished by: Date: Relinquished by: Time: Received by: Time: Received by:



Environmental and Analytical Services-Since 1994
California State Accredited Laboratory in Accordance with ELAP Certificate # 2332

Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: October 28, 2014

Laboratory Number: 142696

Project Name: PF Hermosa Weekly NPDES

Sampled by: Client

On October 23, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION

CAS LAB NUMBER ID

UNICEL OUT

.142696-01 142696**-**02*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt
Ruth Juris @-EDT
Mike Apple @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 1 page excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 10/22/14

CAS LAB NO: 142696

Date Received: 10/23/14 Analyst: GM Date Analyzed: 10/27/14

Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142696-01	Unicel Out	13	1	1	<u>-</u>

QUALITY CONTROL DATA

142696-MB Method Blank ND 1

Chain of Custody

LTS	Environme	ntal. Inc.	Report t	FM O&G	c/o Steve Lawry		7/	Bill to: Accoun	to Davable
	Adirondack	•			ore eleve Lawry		f.		ts Payable
	entura, CA								n Ste 3100
	805-644-4						· ····	Houston,	TX, 77002
FACILITY:		Hermosa					SUBMITTED T	O: Conco A	nalidiaal Camiaaa
COLLECTOR	₹:	LTS					REPORT TO:	O. Capco Al	nalytical Services PHONE:
PROJECT/CI	HARGE#	Weekly NPD	ES				COPIES TO:	Platform Supervisor	
RESULTS RI	EQUIRED:	Normal	· · · · · · · · · · · · · · · · · · ·				001 120 10.	201 S. Broadway,	PHONE: 044-4360
RESULTS B	Y: PHONE:		FAX:					Orcutt, CA 93455	
	3				<u>. </u>		790	w	10/30 10/31
SAMPLE	SAMPLE	ID/LOCATION	GRAB/	VOLUME	DATE/TIME	Pre-	36	ANALYSES REQUEST	
NO.			COMP.		COLLECTED	serv			,
1	Uni	icel out	grab	1	Date: 10/22/14 Time: 1700	HCI	EPA 1664	Abs (08) IR (10)	
2	Uni	cel out	grab	1	10/23/2014	1	No IR run		
					620		E24		
			8		4				
						ļ			
			31					•	
							Field Notes		
	ļ						Multiple shut	downs (10/22) before I c	ame onto the platform.
					8	ł		ng combined with well	
		-						cal) made the water in	
			,		56			5). First part of NPDES	_
								atform immediately los	
								r till +2100 that evenin	
						ļ		e ability to reliably get	
						ŀ		ple point, owing to flow ack in service (10/23).	w irregularities.
Comments:	! Run #1. H	nld #2	[<u> </u>	I TO DE DE	LOK III SELVICE (10/23).	
o iningina.	- vers Wiell	-					 		
							1000	٥	en verifica
Relinquished	by:	Certin	7	Date:	10.23-14	Relinquis	hed by:	<u> </u>	Date: (6~27-1
Received by:			(4)		1140	Received			Time:
					(30)			- Table 1 Company (Company Com	
Relinquished l	by:			Date:		Relinquis			Date:
Received by:				Time:		Received	by:		Time:



Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: November 6, 2014

Laboratory Number: 142754

Project Name: PF Hermosa Weekly NPDES

CAMPLE DECORTORION

Sampled by: Client

On October 29, 2014, Capco Analytical Services, Inc.(CAS), received four(4) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
UNICEL OUT	142754-01
UNICEL OUT	142754-02*
UNICEL OUT	142754-03*
UNICEL OUT	142754-04*

*HOLD PER CUSTOMER'S REQUEST

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @-Orcutt

Ruth Juris @-EDT Mike Apple @-EDT

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 10/28/14

CAS LAB NO: 142754

Date Received: 10/29/14 Date Analyzed: 11/03/14

Analyst: GM

Sample Matrix: Water

OIL & GREASE ANALYSIS EPA METHOD 1664

CAS LAB #	Sample ID	a 	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
						
142754-01	Unicel Out		6.2	1	1	5

QUALITY CONTROL DATA

142754-MB Method Blank ND 1 1

Chain of Custody

704 / Ve FACILITY:	Environmental, In Adirondack Avena entura, CA 93003 805-644-4560 Herm	ue	tı FM O&C	S c/o Steve Lawry		SUBMITTED	
PROJECT/CI	HARGE# Week	ly NPDES				REPORT TO:	Platform Supervisor PHONE: 644-4560
RESULTS RI		AI FAX:		V 1000			201 S. Broadway, PHONE: Orcutt, CA 93455 Ruth Juris
SAMPLE NO.	SAMPLE ID/LOCA	TION GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	Pre- serv	et.	ANALYSES REQUESTED (METHOD)
1	Unicel out		1	Date: 10/28/14 Time: 1145	HCI	EPA 1664	Abs (08) IR (10)
2	/	/	/	1215			Abs (10) IR (12)
3			/	1245			142754
4	<u>K</u>	+	/	1315	+		
				*	e .	<u>1</u>	
Comments:	Run #1, Hold #2-	4 9					
Relinquished t Received by:	by:		Date: Time:	10-29-14 936	Relinquis Received		Date: Time:
Relinquished because the Received by:	by:		Date:		Relinquis Received		Date: Time:
						88	27 642



September 10, 2014

Freeport -McMoRan Oil & Gas Attn: Ruth Juris 201 S. Broadway Orcutt, CA 93455

Dear Ms. Juris:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995 "All acceptability criteria were met. This is a valid test." Results were as follows:

CLIENT:

Freeport -McMoRan Oil & Gas

SAMPLE I.D.:

Produced Water Discharge (Platform Hermosa)

DATE RECEIVED:

13 Aug - 14

ABC LAB. NO.:

LTS0814.151

CHRONIC TOPSMELT SURVIVAL & GROWTH BIOASSAY

IWC CONCENTRATION = 0.0479 %

TST RESULT

SURVIVAL

PASS

GROWTH

PASS

Yours very truly,

Scott Johnson

Laboratory Director

CETIS Summary Report

Report Date:

08 Sep-14 15:50 (p 1 of 2)

Test Code:

LTS0814.151tops | 05-7921-8329

Pacific Topsm	neit 7-d Survival an	d Grow	th Test				_		Aquatic	Bioassay &	Consulting	Labs, Inc
Batch ID:	est Type: Growth-Survival (7d)					An	ałyst:					
Start Date:	13 Aug-14 15:01	Pro	tocol:	EPA	/600/R-95/ ⁻	136 (1995)		Dil	uent: La	Laboratory Seawater		
Ending Date:	20 Aug-14 13:05	Spe	cies:	Athe	rinops affin	is		Bri	ne: No	t Applicable		
Ouration:	6d 22h	Sou	rce:	Aqua	atic Biosyst	ems, CO		Ag				
Sample ID:	16-7163-2259	Cod	le:	LTS	0814.151to	ps		Cli	ent: LT	S Environme	ntal, Inc.	
Sample Date:	12 Aug-14 09:00	Mat	erial:	Sam	ple Water			Pro	oject:			
Receive Date:	13 Aug-14 08:35	Sou	rce:	Bioa	ssay Repo	rt						
Sample Age:	30h (1.8 °C)	Stat	ion:	Platf	orm Hermo	osa						
Comparison S	Summary											
Analysis ID	Endpoint		NOEL		LOEL	TOEL	PMSD	TU	Method			
16-5501-7449	7d Survival Rate		0.071	9	>0.0719	NA	NA	1391	Steel Ma	any-One Rank	Sum Test	
7-3093-9101	Mean Dry Biomass	s-mg	0.071	9	>0.0719	NA	19.3%	1391	Dunnett	Multiple Com	parison Tes	st
Point Estimate	Summary											
Analysis ID	Endpoint		Level		%	95% LCL	95% UCL	TU	Method			
00-4291-7886	7d Survival Rate		EC5		>0.0719	N/A	N/A	<1391	Linear Ir	nterpolation (I	CPIN)	
			EC10		>0.0719	N/A	N/A	<1391				
			EC15		>0.0719	N/A	N/A	<1391				
			EC20		>0.0719	N/A	N/A	<1391				
			EC25		>0.0719	N/A	N/A	<1391				
			EC40		>0.0719	N/A	N/A	<1391				
			EC50		>0.0719	N/A	N/A	<1391				
0-9180-9160	Mean Dry Biomass	-mg	IC5		>0.0719	N/A	N/A	<1391	Linear Ir	Linear Interpolation (ICPIN)		
			IC10		>0.0719	N/A	N/A	<1391				
			IC15		>0.0719	N/A	N/A	<1391				
			IC20		>0.0719	N/A	N/A	<1391				
			IC25		>0.0719	N/A	N/A	<1391				
			IC40		>0.0719	N/A	N/A	<1391				
			IC50		>0.0719	N/A	N/A	<1391				
Test Acceptab	llity											
Analysis ID	Endpoint		Attrib			Test Stat	TAC Limi	ts	Overlap			·
00-4291-7886	7d Survival Rate		Contro		•	1	0.8 - NL		Yes		cceptability	
6-5501-7449	7d Survival Rate		Contro		•	1	0.8 - NL		Yes		cceptability	
0-9180-9160	Mean Dry Biomass	_	Contro		•	1.11	0.85 - N L		Yes		cceptability	
7-3093-9101	Mean Dry Biomass		Contro		P	1.11	0.85 - N L		Yes	Passes A	cceptability	Criteria
7-3093-9101	Mean Dry Biomass	-mg	PMSE	· · · · · ·		0.1925	NL - 0.5		No	Passes A	cceptability	Criteria
'd Survival Ra	•		Mari		0 FB/ 1 O	050/ 110:	881			01:-		
		ount	Mean		95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effec
	Negative Control 5		1		1	1	1	1	0	0	0.0%	0.0%
0.024	5		1		1	1	1	1	0	0	0.0%	0.0%
.0479	5		1		1	1	1	1	0	0	0.0%	0.0%
.0719	5		1		1	1	1	1	0	0	0.0%	0.0%
•	nass-mg Summary Control Type Co	ount	Mean		05% 1 01	05% UC	Min	May	C+4 =	Ctd Dav	CVP/	0/ Fes
		June	Mean		95% LCL	95% UCL	Min	Max	Std Err		CV%	%Effec
			1.11		1.001	1.22	1.01	1.23	0.03938		7.93%	0.0%
)	Negative Control 5				0.0067	4 225	$\Lambda \Lambda \Lambda$	4 272			4 5 000/	
)).024	5		1.116		0.8967	1.335	0.94	1.376	0.07898		15.82%	-0.5%
	•				0.8967 1.262 1.02	1.335 1.439 1.564	0.94 1.272 1.066	1.376 1.428 1.626	0.07898 0.03181 0.09813	0.07113	15.82% 5.27% 16.98%	-0.5% -21.65% -16.35%

CETIS Summary Report

Report Date:

08 Sep-14 15:50 (p 2 of 2)

Test Code:

LTS0814.151tops | 05-7921-8329

						Test Code:	LTS0814.151tops 05-7921-8329
psmeit 7-d Survival	and Grov	wth Test				Aquatic	Bioassay & Consulting Labs, Inc.
al Rate Detail				-			· · · · · · · · · · · · · · · · · · ·
Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
Negative Control	1	1	1	1	1		
	1	1	1	1	1		
	1	1	1	1	1		
	1	1	1	1	1		
Biomass-mg Detail							
Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
Negative Control	1.16	1.106	1.01	1.046	1.23		
	0.94	0.982	1.376	1.2	1.082		
	1.388	1.272	1.428	1.388	1.278		
	1.302	1.34	1.066	1.126	1.626		
ıl Rate Binomials			· · · · · · · · · · · · · · · · · · ·				
Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
Negative Control	5/5	5/5	5/5	5/5	5/5		
	5/5	5/5	5/5	5/5	5/5		
	5/5	5/5	5/5	5/5	5/5		
	5/5	5/5	5/5	5/5	5/5		
	Al Rate Detail Control Type Negative Control Biomass-mg Detail Control Type Negative Control	Control Type Rep 1 Negative Control 1 1 1 1 Blomass-mg Detail Control Type Rep 1 Negative Control 1.16 0.94 1.388 1.302 Il Rate Binomials Control Type Rep 1 Negative Control 5/5 5/5	Control Type	Control Type Rep 1 Rep 2 Rep 3	Control Type Rep 1 Rep 2 Rep 3 Rep 4	Rate Detail Control Type Rep 1 Rep 2 Rep 3 Rep 4 Rep 5	Rate Detail Control Type Rep 1 Rep 2 Rep 3 Rep 4 Rep 5

Analyst:____QA:__

Report Date:

08 Sep-14 15:50 (p 1 of 4)

Test Code:

LTS0814.151tops | 05-7921-8329

								1est	Code:			05-7921-83	
Pacific Topsn	neit 7-d Survival	and Gro	wth Test	·					Aquatic	Bioassay &	Consultin	ıg Labs, In	
Analysis ID:	16-5501-7449		•	Survival Rat			***********************	CETIS Version: CETISv1.8.7					
Analyzed:	05 Sep-14 15:2		<u> </u>	onparametric-		VS I	reatments	Official Results: Yes					
Sample ID:	16-7163-2259		tode: LTS0814.151tops					Clie		S Environme	ntai, inc.		
-	12 Aug-14 09:0		aterial: Sample Water					Proj	ect:				
	13 Aug-14 08:3		ource: Bioassay Report										
Sample Age:	30h (1.8 °C)		tation: Pla	atform Hermo	osa 								
Data Transfor		Zeta	Alt Hyp			Seed			NOEL	LOEL	TOEL	TU	
Angular (Corre		NA .	C>1	NA ————	NA				0.0719	>0.0719	NA	1391	
_ •	ne Rank Sum Te	est	T4 04-4	0-1411			D.V-1	D =		. ==4.			
Control	vs C-%		Test Stat		Ties		P-Value	P-Type	Decision				
Negative Contr			27.5	17	1	8	0.7500	Asymp	-	nificant Effect			
0.0479			27.5	17	1	8	0.7500	Asymp	_	nificant Effect			
	0.0719		27.5		1	8	0.7500	Asymp	Non-Sigr	nificant Effect	<u> </u>		
ANOVA Table													
Source	Sum Squa	ares	Mean Sq	uare	DF		F Stat	P-Value	Decision	` 			
Between			0		3 65540		<0.0001	Significa	nt Effect				
Error	0		0		16		_						
Total					19			*					
7d Survival Ra	•												
	Control Type	Count	Mean	95% LCL	95% L	JCL_		Min	Max	Std Err	CV%	%Effec	
	Negative Control		1	1	1		1	1 1	1	0	0.0%	0.0%	
0.024		5	1	1	1		1	1	1	0	0.0%	0.0%	
0.0479		5	1	1	1		1	1	1	0	0.0%	0.0%	
0.0719		5	1	1	1		1	1	1	0	0.0%	0.0%	
Angular (Corre	ected) Transform	ned Sum	mary										
	Control Type	Count	Mean	95% LCL	95% L	ICL	Median	Min	Max	Std Err	CV%	%Effec	
	Negative Contr	5	1.345	1.345	1.346		1.345	1.345	1.345	0	0.0%	0.0%	
0.024		5	1.345	1.345	1.346		1.345	1.345	1.345	0	0.0%	0.0%	
0.0479		5	1.345	1.345	1.346		1.345	1.345	1.345	0	0.0%	0.0%	
0.0719		5	1.345	1.345	1.346		1.345	1.345	1.345	0	0.0%	0.0%	
7d Survival Ra	rte Detail												
	Control Type	Rep 1	Rep 2	Rep 3	Rep 4		Rep 5						
	Negative Control		1	1	1		1						
0.024		1	1	1	1		1						
0.0479		1	1	1	1		1						
0.0719		1	1	1	1		1						
Angular (Corre	ected) Transform	ned Deta	il								_		
	Control Type	Rep 1	Rep 2	Rep 3	Rep 4		Rep 5				·		
	Negative Control		1.345	1.345	1.345		1.345						
0.024		1.345	1.345	1.345	1.345		1.345						
0.0479		1.345	1.345	1.345	1.345		1.345						
0.0719		1.345	1.345	1.345	1.345		1.345						
7d Survival Ra	te Binomials												
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	ı	Rep 5						
0	Negative Control	5/5	5/5	5/5	5/5		5/5						
0.024		5/5	5/5	5/5	5/5		5/5						
0.0479		5/5	5/5	5/5	5/5		5/5						
0.0740		EIE	EIE	EIE	E/E		EIE						

5/5

5/5

5/5

0.0719

5/5

5/5

Report Date:

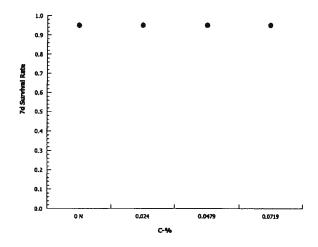
08 Sep-14 15:50 (p 2 of 4)

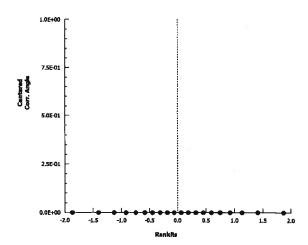
Test Code:

LTS0814.151tops | 05-7921-8329

Pacific Topsr	nelt 7-d Survival and	Growth Test		Aquatic Bi	oassay & Consulting Labs, Inc.
Analysis ID:	16-5501-7449	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	05 Sep-14 15:23	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes







Report Date:

08 Sep-14 15:50 (p 3 of 4)

Test Code:

LTS0814.151tops | 05-7921-8329

Pacific Tone	melt 7-d Survival	and Gro	with Tost			-		Aguatia	linaseau P (oneultine	Lobo In	
	****								Bioassay & (Lads, In	
Analysis ID:	17-3093-9101		-	lean Dry Biom	_			iS Version:		8.7		
Analyzed:	05 Sep-14 15:2	3 A	nalysis: P	arametric-Cor	itrol vs Trea	tments	Official Results: Yes					
Sample ID:	16-7163-2259	С	ode: L	TS0814.151to	ps		Client: LTS Environmental, Inc.					
Sample Date	: 12 Aug-14 09:0	0 M	aterial: S	ample Water			Project:					
Receive Date	e: 13 Aug-14 08:3	5 S	ource: B	ioassay Repo	rt							
Sample Age:	30h (1.8 °C)	S	tation: P	latform Hermo	sa							
Data Transfo	orm	Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	TU	
Untransforme	d	NA	C > T	NA	NA		19.3%	0.0719	>0.0719	NA	1391	
Dunnett Mult	tiple Comparison	Test						•				
Control	vs C-%		Test Sta	nt Critical	MSD DF	P-Value	P-Type	Decision	(a:5%)			
Negative Con	trol 0.024		-0.0583	2.227	0.214 8	0.7704	CDF	Non-Sign	ificant Effect		·	
	0.0479		-2.504	2.227	0.214 8	0.9992	CDF	_	ificant Effect			
	0.0719		-1.892	2.227	0.214 8	0.9960	CDF	-	ificant Effect			
ANOVA Table	e				·							
Source	Sum Squa	res	Mean S	quare	DF	F Stat	P-Value	Decision	(a:5%)			
Between	0.2254582		0.07515	272	3	3.262	0.0490	Significar			·	
Error	0.3685841		0.02303	65	16			•				
Total	0.5940422				19	_						
Distributiona	il Tests					<u>.</u>						
Attribute	Test	4		Test Stat	Critical	P-Value	Decision	(a:1%)				
Variances	Bartlett Ed	quality of	Variance	5.669	11.34	0.1289	Equal Va	riances				
√ariances	Mod Leve	ne Equal	ity of Varian	ce 2.273	5.953	0.1323	Equal Va	riances				
Variances	Levene Ed	quality of	Variance	1.727	5.292	0.2017	Equal Va	riances				
Distribution	Shapiro-W	Vilk W No	ormality	0.956	0.866	0.4678	Normal D	istribution				
Distribution	Kolmogore	ov-Smirn	ov D	0.1232	0.2235	0.6164	Normal D	istribution				
Distribution	D'Agostine	o Skewne	ess	1.375	2.576	0.1692	Normal D	istribution				
Distribution	D'Agostine	o Kurtosi	S	0.8997	2.576	0.3683	Normal D	istribution				
Distribution	D'Agostine	o-Pearso	n K2 Omnib	us 2.699	9.21	0.2593	Normal D	istribution				
Distribution	Anderson-	Darling A	A2 Normality	0.36	3.878	0.4529	Normal D	istribution				
Mean Dry Bio	omass-mg Summ	ary						36				
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effec	
)	Negative Control	5	1.11	1.001	1.22	1.106	1.01	1.23	0.03938	7.93%	0.0%	
0.024		5	1.116	0.8967	1.335	1.082	0.94	1.376	0.07898	15.82%	-0.5%	
		5	1.351	1.262	1.439	1.388	1.272	1.428	0.03181	5.27%	-21.65%	
0.0479		5	1.292	1.02	1.564	1.302	1.066	1.626	0.09813	16.98%	-16.35%	
0.0719	omass-mg Detail											
0.0719 Mean Dry Bio	omass-mg Detail Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
0.0719 Mean Dry Bio C-%	_	Rep 1		Rep 3	Rep 4 1.046	Rep 5						
0.0719 Mean Dry Bi o C-% 0	Control Type	Rep 1	Rep 2			<u> </u>						
0.0479 0.0719 Mean Dry Bio C-% 0 0.024 0.0479	Control Type	Rep 1	Rep 2	1.01	1.046	1.23	<u> </u>					

Analyst:_____QA:___

Report Date:

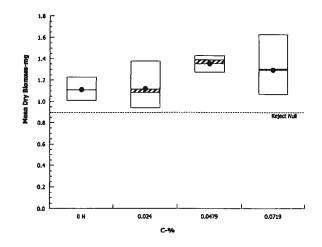
08 Sep-14 15:50 (p 4 of 4)

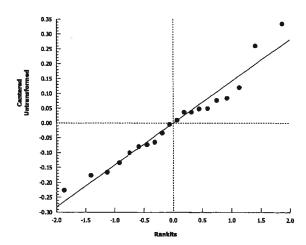
Test Code:

LTS0814.151tops | 05-7921-8329

Pacific Tops	melt 7-d Survival and	Growth Test		Aquatic B	loassay & Consulting Labs, Inc.
Analysis ID:	17-3093-9101	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	05 Sep-14 15:23	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Graphics





Report Date:

08 Sep-14 15:50 (p 1 of 3)

Test Code:

LTS0814.151tops | 05-7921-8329

									lest	Code:	LIS0814.	1 51tops 0	15-7921-8329
Pacific	Topsme	elt 7-d Survival	and Grow	th Test	;					Aquatic B	ioassay &	Consultin	g Labs, Inc.
•	Analysis ID: 00-4291-7886 Analyzed: 05 Sep-14 15:2			ipoint: alysis:	7d Survival Rat Linear Interpola)			S Version: ial Results:	CETISv1 Yes	.8.7	
Sample	Sample ID: 16-7163-2259 C			de:	LTS0814.151tops					t: LTS	Environme	ntal, Inc.	
Sample	e Date:	12 Aug-14 09:0	0 M a	terial:	Sample Water				Proje	ct:			
Receive	e Date:	13 Aug-14 08:3	5 So i	ırce:	Bioassay Repo	rt							
Sample	Age:	30h (1.8 °C)	Sta	tion:	Platform Hermo	osa							
Linear	Interpol	ation Options										_	
X Trans	sform	Y Transform	n See	d	Resamples	Exp 95%	CL	Method					
Linear		Linear	0		280	Yes		Two-Point	Interp	olation			
Point E	stimate	8											· · · · · · · · · · · · · · · · · · ·
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL							
EC5	>0.071	9 N/A	N/A	<139	1 NA	NA							1.
EC10	>0.071		N/A	<139	1 NA	NA							
EC15	>0.071		N/A	<139		NA							
EC20	>0.071		N/A	<139		NA							
EC25	>0.071		N/A	<139		NA							
EC40	>0.071		N/A	<139		NA							
EC50	>0.071	9 N/A	N/A	<139	1 NA	NA							
7d Sur	/Ival Rat	te Summary				Calcu	ulated	Variate(A/I	3)			-	
C-%		ntrol Type	Count	Mear	n Min_	Max	Std	Err Std	Dev	CV%	%Effect	Α	В
0	Ne	gative Control	5	1	1	1	0	0		0.0%	0.0%	25	25
0.024			5	1	1	1	0	0		0.0%	0.0%	25	25
0.0479			5	1	1	1	0	0		0.0%	0.0%	25	25
0.0719			5	1	1	1	0	0		0.0%	0.0%	25	25
7d Surv	ival Rat	e Detail											
C-%	Co	ntrol Type	Rep 1	Rep 2	2 Rep 3	Rep 4	Rep	5					\$1 30
0	Ne	gative Control	1	1	1	1	1				,		7
0.024			1	1	1	1	1						
0.0479			1	1	1	1	1						
0.0719			1	1	1	1	1						
7d Surv	vival Rat	e Binomials											
C-%		ontrol Type	Rep 1	Rep 2		Rep 4	Rep	5					
0	N	legative Contro	1 5/5	5/5	5/5	5/5	5/5						
0.024			5/5	5/5	5/5	5/5	5/5						
0.0479			5/5	5/5	5/5	5/5	5/5						
0.0719			5/5	5/5	5/5	5/5	5/5						

Analyst: QA:

Report Date:

08 Sep-14 15:50 (p 2 of 3)

Test Code:

LTS0814.151tops | 05-7921-8329

Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

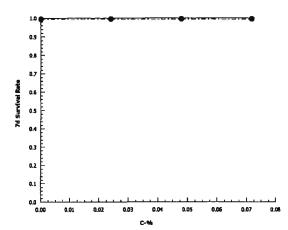
00-4291-7886 05 Sep-14 15:23 Endpoint: 7d Survival Rate

Analysis: Linear Interpolation (ICPIN)

CETIS Version: CET Official Results: Yes

CETISv1.8.7

Graphics



Report Date:

08 Sep-14 15:50 (p 3 of 3)

Test Code:

LTS0814.151tops | 05-7921-8329

	_							lest Code	<u>; </u>	L150814.151tops 05-7921-8329		
Pacific	Topsme	elt 7-d Survival	and Grow	th Test				Aqu	uatic Bi	loassay & Consulting Labs, Inc.		
Analys	ls ID:	10-9180-9160	End	lpoint:	Mean Dry Biom	ass-mg		CETIS Version: CETISv1.8.7				
Analyz	ed:	05 Sep-14 15:2	3 Ana	iysis:	Linear Interpola		Official Results: Yes					
Sample	D:	16-7163-2259	Cod	le:	LTS0814.151to	ps		Client:	LTS	Environmental, Inc.		
Sample	Date:	12 Aug-14 09:0	0 Mat	eriai:	Sample Water		Project:					
Receive	e Date:	13 Aug-14 08:3	5 Sο ι	ırce:	Bioassay Repor	rt						
Sample	Age: 3	30h (1.8 °C)	Sta	tion:	Platform Hermo	osa						
Linear	Interpola	ition Options		-	<u>-</u>							
X Trans	sform	Y Transform	See	d	Resamples	Exp 95% CL	Method					
Linear		Linear	183	119	280	Yes	Two-Point	Interpolatio	n			
Point E	stimates	s										
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL						
IC5	>0.071	9 N/A	N/A	<1391	NA	NA						
IC10	>0.071	9 N/A	N/A	<1391	NA	NA						
IC15	>0.071	9 N /A	N/A	<1391	NA	NA						

Mean Dry B	iomass-mg Summ	nary			C	alculated Va	riate		10
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.11	1.01	1.23	0.03938	0.08805	7.93%	0.0%
0.024		5	1.116	0.94	1.376	0.07898	0.1766	15.82%	-0.5%
0.0479		5	1.351	1.272	1.428	0.03181	0.07113	5.27%	-21.65%
0.0719		5	1.292	1.066	1.626	0.09813	0.2194	16.98%	-16.35%

NA

NA

NA

NA

Mean Dry Biomass-mg Detail

>0.0719

>0.0719

>0.0719

>0.0719

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
Negative Control	1.16	1.106	1.01	1.046	1.23	
	0.94	0.982	1.376	1.2	1.082	
	1.388	1.272	1.428	1.388	1.278	
	1.302	1.34	1.066	1.126	1.626	
		Negative Control 1.16 0.94 1.388	Negative Control 1.16 1.106 0.94 0.982 1.388 1.272	Negative Control 1.16 1.106 1.01 0.94 0.982 1.376 1.388 1.272 1.428	Negative Control 1.16 1.106 1.01 1.046 0.94 0.982 1.376 1.2 1.388 1.272 1.428 1.388	Negative Control 1.16 1.106 1.01 1.046 1.23 0.94 0.982 1.376 1.2 1.082 1.388 1.272 1.428 1.388 1.278

<1391

<1391

<1391

<1391

NΑ

NA

NA

NA

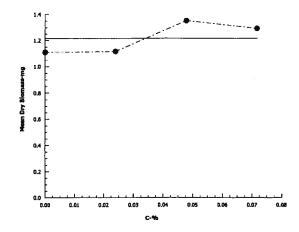
Graphics

IC20

IC25

IC40

IC50



Analyst: QA:

CETIS Measurement Report

Report Date:

08 Sep-14 15:50 (p 1 of 2)

Test Code:

LTS0814.151tops | 05-7921-8329

								Test Code:	LIGOUI	r. ro rtopa j c	13-1321-0329
Pacific Topsm	elt 7-d Surviva	l and G	rowth Test					Aqua	atic Bioassay &	k Consulting	g Labs, Inc.
Batch ID:	13-3920-0167		Test Type:	Growth-Survival (7d)				Analyst:			
Start Date:	13 Aug-14 15:0)1	Protocol:	EPA/600/R-95	/136 (1995)			Diluent:	Laboratory Se	awater	
Ending Date:	20 Aug-14 13:0)5	Species:	Atherinops affinis			Brine:	Not Applicable	•		
Duration:	6d 22h		Source:	Aquatic Biosystems, CO				Age:			
Sample ID:	16-7163-2259		Code:	LTS0814.151td	ops			Client:	LTS Environm	ental, Inc.	
Sample Date:	12 Aug-14 09:0	90	Material:	Sample Water				Project:			
Receive Date:	13 Aug-14 08:3	35	Source:	Bioassay Repo	ort						
Sample Age:	30h (1.8 °C)		Station:	Platform Herm	osa						
Dissolved Oxy	/gen-mg/L										
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std E	rr Std Dev	CV%	QA Count
0	Negative Contr	8	6.338	5.512	7.163	4.5	8.1	0.348	9 0.987	15.57%	Ō
0.024		8	5.738	5.001	6.474	4	6.7	0.311	6 0.8815	15.36%	0
0.0479		8	5.625	4.845	6.405	4	6.7	0.329	9 0.9331	16.59%	0
0.0719		8	5.6	4.717	6.483	4	6.8	0.373	2 1.056	18.85%	0
Overall		32	5.825			4	8.1				0 (0%)
pH-Units											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std E	rr Std Dev	CV%	QA Count
<u> </u>	Negative Contr	8	7.488	7.383	7.592	7.4	7.7	0.044	0.1246	1.67%	0
0.024		8	7.5	7.437	7.563	7.4	7.6	0.026	73 0.07559	1.01%	0
0.0479		8	7.488	7.434	7.541	7.4	7.6	0.022	266 0.06409	0.86%	0
0.0719		8	7.488	7.434	7.541	7.4	7.6	0.022	266 0.06409	0.86%	0
Overall		32	7.491			7.4	7.7				0 (0%)
Salinity-ppt											
	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std E	rr Std Dev	CV%	QA Count
)	Negative Contr	8	34	34	34	34	34	0	0	0.0%	0
0.024		8	34	34	34	34	34	0	0	0.0%	0
0.0479		8	34	34	34	34	34	0	0	0.0%	0
0.0719		8	34	34	34	34	34	0	0	0.0%	0
Overall		32	34			34	34				0 (0%)
Femperature-°	С										
	Control Type	Count		95% LCL	95% UCL	Min	Max			CV%	QA Count
	Negative Contr		21	21	21	21	21	0	0	0.0%	0
0.024		8	21	21	21	21	21	0	0	0.0%	0
0.0479		8	21	21	21	21	21	0	0	0.0%	0
0.0719		8	21	21	21	21	21	0	0	0.0%	0
Overall		32	21			21	21				0 (0%)

CETIS Measurement Report

Report Date:

08 Sep-14 15:50 (p 2 of 2)

Test Code:

LTS0814.151tops | 05-7921-8329

							- 19	est Code:	L130614.151tops 05-7921-8329
Pacific To	psmeit 7-d Surviva	and Gre	owth Test					Aquatio	Bioassay & Consulting Labs, Inc.
Dissolved	Oxygen-mg/L			*					
C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	6.3	8.1	6.2	6.5	6.8	6.1	6.2	4.5
0.024		6.4	6.5	5.4	6.1	6.7	5.4	5.4	4
0.0479		6.3	6.5	5.4	6.1	6.7	5.1	4.9	4
0.0719		6.5	6.8	5.1	6.1	6.7	4.8	4.8	4
pH-Units									
C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.4	7.4	7.6	7.6	7.7	7.4	7.4	7.4
0.024		7.5	7.5	7.6	7.6	7.5	7.4	7.5	7.4
0.0479		7.5	7.5	7.6	7.5	7.5	7.4	7.5	7.4
0.0719		7.5	7.5	7.6	7.5	7.5	7.4	7.5	7.4
Salinity-pp	t			-				<u></u>	
C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	34	34	34	34	34	34	34	34
0.024		34	34	34	34	34	34	34	34
0.0479		34	34	34	34	34	34	34	34
0.0719		34	34	34	34	34	34	34	34
Temperatu	re-°C				_				
C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	21	21	21	21	21	21	21	21
0.024		21	21	21	21	21	21	21	21
0.0479		21	21	21	21	21	21	21	21
0.0719		21	21	21	21	21	21	21	21

Analyst: ____QA:__



September 10, 2014

Freeport -McMoRan Oil & Gas Attn: Ruth Juris 201 S. Broadway Orcutt, CA 93455

Dear Ms. Juris:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995. Results were as follows:

CLIENT:

Freeport -McMoRan Oil & Gas

SAMPLE I.D.:

Produced Water Discharge (Platform Hermosa)

DATE RECEIVED:

13 Aug - 14

ABC LAB. NO.:

LTS0814.151

CHRONIC ABALONE LARVAL DEVELOPMENT BIOASSAY

IWC CONCENTRATION = 0.0479 %

TST RESULT

PASS

Yours very truly,

Scott Johnson

Laboratory Director

CETIS Summary Report

Report Date:

08 Sep-14 15:48 (p 1 of 1)

Test Code:

LTS0814.151abs | 11-6027-3066

Red Abaione	Larvai Developm	ent Test		· · ·				Aquatio	c Bioassay & 0	Consulting	Labs, Inc	
Batch ID:	15-6036-7021	Tes	t Type:	Development			Ana	lyst:		_	_	
Start Date:	13 Aug-14 12:02	2 Pro	tocol:	EPA/600/R-95/	136 (1995)		Dilu	ent: La	aboratory Seav	water		
Ending Date:	15 Aug-14 12:00) Spe	ecies:	Haliotis rufesce	ens		Brin	ie: N	ot Applicable			
Duration:	48h	Soi	ırce:	Cultured Abalo	ne		Age	:				
Sample ID:	02-2133-9532	Cod	de:	LTS0814.151al	bs		Clie	nt: L	TS Environmer	ntal, inc.		
-	12 Aug-14 09:00		terial:	Sample Water	-		Pro			•		
•	: 13 Aug-14 08:35		urce:	Bioassay Repo	rt			,550				
Sample Age:	=		tion:	Platform Hermo								
Comparison S	Summary									***************************************		
Analysis iD_	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Method	i			
13-1126-4472	Proportion Norm	nal	0.0719	9 >0.0719	NA	NA	1391	Steel M	lany-One Rank	Sum Test	1	
Point Estimat	e Summary											
Analysis ID	Endpoint		Level	%	95% LCL	95% UCL	ŢU	Method				
11-3129-1619	Proportion Norm	nal	EC5	>0.0719	N/A	N/A	<1391	Linear I	Interpolation (I	CPIN)		
			EC10	ຸ>0.0719	N/A	N/A	<1391					
			EC15	>0.0719	N/A	N/A	<1391					
			EC20	>0.0719	N/A	N/A	<1391					
			EC25	>0.0719	N/A	N/A	<1391					
			EC40	>0.0719	N/A	N/A	<1391					
			EC50	>0.0719	N/A	N/A	<1391		# #			
Test Acceptat	oility		_						i			
Analysis ID	Endpoint		Attrib	ute	Test Stat	TAC Limi	ts	Overlap Decision				
11-3129-1619	Proportion Norm	ıal	Contro	ol Resp	1 0.8 - NL			Yes Passes Acceptability Cri			/ Criteria	
	•			ol Resp 1 0.8 - NL						acantabilit	Criteria	
13-1126-4 4 72	Proportion Norm	ıal	Contro	ol Resp	1	0.8 - NL		Yes	Passes A	cceptability	- Cittoria	
	Proportion Norm	ıal	Contro	ol Resp	1	0.8 - NL		Yes	Passes A			
Proportion No	<u> </u>	Count	Contro	95% LCL		·	Max	Yes Std Eri	*	CV%		
Proportion No C-%	ormal Summary	Count		<u>·</u>		·	Max 1			CV% 0.0%		
Proportion No C-% 0 0.024	ormal Summary Control Type	Count 5	Mean 1	95% LCL	95% UCL	Min		Std Eri	r Std Dev	CV% 0.0% 0.0%	%Effec	
Proportion No C-% D.024	ormal Summary Control Type	Count 5 5 5	Mean 1 1 1	95% LCL 1 1 1	95% UCL	Min 1	1	Std Err	r Std Dev	CV% 0.0% 0.0% 0.0%	%Effec	
Proportion No C-% D.024 D.0479	ormal Summary Control Type	Count 5	Mean 1	95% LCL 1	95% UCL 1 1	Min 1	1	Std Err	r Std Dev	CV% 0.0% 0.0%	%Effec 0.0% 0.0%	
Proportion No. C-% 0.0024 0.0479 0.0719	ormal Summary Control Type Negative Control	Count 5 5 5	Mean 1 1 1 1	95% LCL 1 1 1	95% UCL 1 1	Min 1 1 1 1 1	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effec 0.0% 0.0% 0.0%	
Proportion No. C-% D.024 D.0479 D.0719 Proportion No. C-%	Control Type Negative Control ormal Detail Control Type	Count 5 5 5 5 5 Fee 1	Mean 1 1 1 1 Rep 2	95% LCL 1 1 1 1 Rep 3	95% UCL 1 1 1 1 1	Min 1 1 1 1 1 Rep 5	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	
Proportion No. C-% D.0.024 D.0.0479 D.0.0719 Proportion No. C-%	ormal Summary Control Type Negative Control	Count 5 5 5 5 5 5 7 Rep 1 1	Mean 1 1 1 1 Rep 2	95% LCL 1 1 1 1 Rep 3	95% UCL 1 1 1 1 1 Rep 4	Min 1 1 1 1 1 1 1 1 1	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	
Proportion No. 0-% 0.024 0.0479 0.0719 Proportion No. 0-%	Control Type Negative Control ormal Detail Control Type	Count 5 5 5 5 5 Fee 1	Mean 1 1 1 1 Rep 2	95% LCL 1 1 1 1 Rep 3	95% UCL 1 1 1 1 1	Min 1 1 1 1 1 Rep 5	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	
Proportion No. 2-% 0.024 0.0479 0.0719 Proportion No. 2-% 0.024	Control Type Negative Control ormal Detail Control Type	Count 5 5 5 5 5 5 7 Rep 1 1	Mean 1 1 1 1 Rep 2	95% LCL 1 1 1 1 Rep 3	95% UCL 1 1 1 1 1 Rep 4	Min 1 1 1 1 1 1 1 1 1	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	
Proportion No. 2-% 1) 1).024 1).0479 1).0719 Proportion No. 2-% 1) 1).024	Control Type Negative Control ormal Detail Control Type	Count 5 5 5 5 5 5 7 Rep 1 1	Mean 1 1 1 1 Rep 2	95% LCL 1 1 1 1 1 Rep 3 1	95% UCL 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Min 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	
Proportion No. 0.024 0.024 0.0479 0.0719 Proportion No. 0.07 0.024 0.0479	Control Type Negative Control ormal Detail Control Type	Count 5 5 5 5 5 5 1 1 1 1 1 1 1 1	Mean 1 1 1 1 Rep 2 1 1	95% LCL 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	95% UCL 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Min 1 1 1 1 Rep 5 1 1	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	
Proportion No. C-% 0.024 0.0479 0.0719 Proportion No. C-% 0.024 0.0479 0.0719 Proportion No. C-% 0.0719	Control Type Negative Control Control Type Negative Control Control Type Negative Control Control Type Control Type	Count 5 5 5 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1	Mean 1 1 1 1 Rep 2 1 1 1 Rep 2	95% LCL 1 1 1 1 1 1 1 Rep 3 1 1 1 1 Rep 3	95% UCL 1 1 1 1 1 1 1 Rep 4 1 1 1 Rep 4	Min 1 1 1 1 Rep 5 1 1	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	
Proportion No. C-% 0.024 0.0479 0.0719 Proportion No. C-% 0.024 0.0479 0.0719 Proportion No. C-% 0.0719	Control Type Negative Control ormal Detail Control Type Negative Control	Count 5 5 5 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1	Mean 1 1 1 1 Rep 2 1 1 1	95% LCL 1 1 1 1 1 1 1 Rep 3 1 1 1 1 Rep 3	95% UCL 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Min 1 1 1 1 Rep 5 1 1 1	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	
Proportion No. C-% 0.0024 0.00719 Proportion No. 0.0024 0.00719 0.00719 Proportion No. 0.00719 Proportion No. C-% 0.00719 Proportion No. 0.00719 Proportion No. 0.00719 D.0071	Control Type Negative Control Control Type Negative Control Control Type Negative Control Control Type Control Type	Count 5 5 5 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1	Mean 1 1 1 1 Rep 2 1 1 1 Rep 2	95% LCL 1 1 1 1 1 1 1 Rep 3 1 1 1 1 Rep 3 100/100	95% UCL 1 1 1 1 1 1 1 Rep 4 1 1 1 Rep 4	Min 1 1 1 1 1 1 Rep 5 1 1 1 Rep 5	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	
Proportion No. C-% 0 0.024 0.0479 0.0719 Proportion No. C-% 0 0.024 0.0479 0.0719 Proportion No. C-%	Control Type Negative Control Control Type Negative Control Control Type Negative Control Control Type Control Type	Count 5 5 5 5 5 5 5 7 7 1 1 1 1 1 1 1 1 1 1 1	Mean 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	95% LCL 1 1 1 1 1 1 1 Rep 3 1 1 1 1 Rep 3 00 100/100 100/100	95% UCL 1 1 1 1 1 1 Rep 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Min 1 1 1 1 1 1 Rep 5 1 1 1 Roy 5 100/100	1 1 1	Std Err	7 Std Dev 0 0 0	CV% 0.0% 0.0% 0.0%	%Effection	

Report Date:

08 Sep-14 15:48 (p 1 of 2)

Test Code:

LTS0814.151abs | 11-6027-3066

Red Abal	lone	Larval Developn	nent Te	st					Aquatic	Bioassay &	Consultin	g Labs, In	
Analysis Analyzed		13-1126-4472 08 Sep-14 15:4		•	roportion Non		Treatments	CET					
Sample II	D:	02-2133-9532	(Code: LTS0814.151abs					Client: LTS Environmental, Inc.				
Sample [Date:	12 Aug-14 09:0	0 !	Material: S	ample Water			Proj	ect:				
Receive I	Date:	13 Aug-14 08:3	5 \$	Source: B	ioassay Repo	rt							
Sample A	Age:	27h (1.8 °C)		Station: P	latform Hermo	osa							
Data Tran	nsfor	m	Zeta	Alt Hyp	Trials	Seed			NOEL	LOEL	TOEL	TU	
Angular (0	Corre	cted)	NA	C > T	NA	NA	_		0.0719	>0.0719	NA	1391	
Steel Mar	ny-Oı	ne Rank Sum Te	st										
Control		vs C-%		Test Sta			F P-Value	P-Type	Decision				
Negative (Conti			27.5	17	1 8	0.7500	Asymp	-	ificant Effect			
		0.0479		27.5	17	1 8	0.7500	Asymp	_	ificant Effect			
		0.0719		27.5	<u> 17</u>	1 8	0.7500	Asymp	Non-Sigr	ificant Effect	t 		
ANOVA T	able												
Source		Sum Squa	ires	Mean S	quare	DF	F Stat	P-Value	Decision	· · · -			
Between		0		0		3	65540	<0.0001	Significa	nt Effect			
Error Total				0		16 19	_						
	n No	rmal Summary			 .				~,				
D-%	6	Control Type	Count	Mean	95% LCL	95% UCL	. Median	Min	Max	Std Err	CV%	%Effect	
)		Negative Control		1	1	1	1	1	1	0	0.0%	0.0%	
0.024	ſ		5	1	1	1	1	1	1	0	0.0%	0.0%	
0.0479			5	1	1	1	1	1	1	0	0.0%	0.0%	
0.0719			5	1	1	1	1	1	1	0	0.0%	0.0%	
Angular (Corre	ected) Transform	ned Sur	mmarv			-						
C-%		Control Type	Count	- -	95% LCL	95% UCL	. Median	Min	Max	Std Err	CV%	%Effect	
)		Negative Contr	5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%	
0.024		-	5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%	
0.0479			5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%	
0.0719			5	1.521	1.521	1.521	1.521	1.521	1.521	0	0.0%	0.0%	
Proportio	n No	rmal Detail											
C-%		Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
)		Negative Control	1	1	1	1	1				_		
.024			1	1	1	1	1						
0.0479			1	1	1	1	1						
0.0719			1	1		1	1						
•		ected) Transforn											
2-%		Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
)		Negative Control		1.521	1.521	1.521	1.521						
.024			1.521	1.521	1.521	1.521	1.521						
.0479			1.521	1.521	1.521	1.521	1.521						
.0719			1.521	1.521	1.521	1.521	1.521						
•		rmal Binomials											
-%		Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5						
		Negative Control			100/100	100/100	100/100						
			100/10	0 100/100	100/100	100/100	100/100						
0.024													
).02 4).0479).0719			100/100		100/100 100/100	100/100	100/100 100/100						

Analyst:____QA:____

Report Date:

08 Sep-14 15:48 (p 2 of 2)

Test Code:

LTS0814.151abs | 11-6027-3066

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	
Analyzed:	

13-1126-4472 08 Sep-14 15:48

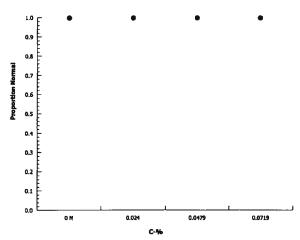
Endpoint: Proportion Normal Analysis:

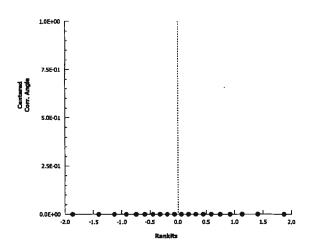
Nonparametric-Control vs Treatments

CETIS Version: Official Results:

CETISv1.8.7 Yes

Graphics





Report Date:

08 Sep-14 15:48 (p 1 of 2)

Test Code:

LTS0814.151abs | 11-6027-3066

									BELC	oge:		L130014	. ID I abs }	11-6027-300
Red Ab	alone La	arval Developn	nent Test			_				Aquat	сВ	ioassay &	Consultir	g Labs, inc
Analysi	is ID:	11-3129-1619	En	dpoint:	Proportion Non	mal		(CETIS	Versi	on:	CETISv1	.8.7	
Analyze	ed:	08 Sep-14 15:4	8 An	nalysis: Linear Interpolation (ICPIN)					Official Results: Yes					
Sample	D:	02-2133-9532	Co	de:	LTS0814.151a	bs	· -	-	Client:		TS	Environme	ntal, Inc.	
Sample	Date:	12 Aug-14 09:0	0 Ma	terial:	Sample Water			F	Projec	t:				
Receive	e Date:	13 Aug-14 08:3	5 So	urce:	Bioassay Repo	rt								
Sample	Age:	27h (1.8 °C)	Sta	tion:	Platform Hermo	osa								
Linear	interpola	ation Options											_	
X Transform Y Transform			d	Resamples	Exp 95%		thod							
Linear ————		Linear	0		280	Yes	Tw	o-Point In	terpol	ation				
Point E	stimates	3												
Level	%	95% LCL	95% UCL	. TU	95% LCL	95% UCL								
EC5	>0.071		N/A	<139°		NA								
EC10	>0.071		N/A	<139°		NA								
EC15	>0.071		N/A	<139°		NA								
EC20	>0.071		N/A	<139		NA								
EC25	>0.071		N/A	<139		NA								
EC40	>0.071		N/A	<139		NA								
EC50	>0.071	9 N/A	N/A	<139	NA	NA								
Proport	tion Nor	mal Summary			Calculated Variate(A						06.		_	
C-%	Co	ntrol Type	Count	Mean		Max	Std Err	Std D)ev	CV%	4	%Effect	Α	В
0	Ne	gative Control	5	1	1	1	0	0		0.0%		0.0%	500	500
0.024			5	1	1	1	0	0		0.0%		0.0%	500	500
0.0479			5	1	1	1	0	0		0.0%	ě	0.0%	500	500
).0719 			5	1	1	1	0	0		0.0%	÷	0.0%	500	500
Proport	tion Nor	mal Detail									100			
>-%		ntrol Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5				09			
)	Ne	gative Control	1	1	1	1	1							
0.024			1	1	1	1	1							
0.0479			1	1	1	1	1							
0.0719			1	1 293	1	1	1							
Proport	ion Norr	nal Binomials	1									-		
C-%	С	ontrol Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5							
)	N	egative Control	100/100	100/1	00 100/100	100/100	100/100)						
0.024			100/100	100/1	00 100/100	100/100	100/100)						
0.0479			100/100	100/1	00 100/100	100/100	100/100)						

Report Date:

08 Sep-14 15:48 (p 2 of 2)

Test Code:

LTS0814.151abs | 11-6027-3066

Red Abalone Larval Development Test

Aquatic Bioassay & Consulting Labs, Inc.

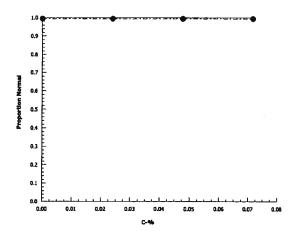
Analysis ID: Analyzed: 11-3129-1619 08 Sep-14 15:48 Endpoint: Proportion Normal

Analysis: Linear Interpolation (ICPIN)

CETIS Version: CET Official Results: Yes

CETISv1.8.7

Graphics



CETIS Measurement Report

Report Date:

08 Sep-14 15:48 (p 1 of 2)

Test Code:

LTS0814.151abs | 11-6027-3066

Red Abalone	Larval Develop	ment To	est ——-						Aqua	tic Bioassay &	Consulting	g Labs, Inc.
Batch ID:	15-6036-7021		Test Type:		opment				alyst:	-	_	
Start Date:	13 Aug-14 12:		Protocol:			/136 (1995)			luent:	Laboratory Sea	water	
Ending Date:	•	00	Species:		is rufesc				ine:	Not Applicable		
Duration:	48h		Source:	Cultur	ed Abaic	one		Ag	je:	 .		
Sample ID:	02-2133-9532		Code:	LTS0	814.151a	abs		CI	ient:	LTS Environme	ental, Inc.	
•	: 12 Aug-14 09:0		Material:	Samp	le Water	•		Pr	oject:			
Receive Date	: 13 Aug-14 08:	35	Source:	Bioas	say Rep	ort						
Sample Age:	27h (1.8 °C)		Station:	Platfo	rm Herm	osa						
Parameter A	cceptability Crite	eria										-
Parameter			Min	Max	Acc	eptability I	Limits	Overlap	Decisio	on		
Salinity-ppt			34	34	32 -	- 36		Yes	Results	Within Limits		70
Temperature-	°C		14.3	14.5	14 -	- 16		Yes	Results	Within Limits		
Dissolved Ox	cygen-mg/L									-	_	
C-%	Control Type	Count	Mean	9	5% LCL	95% UCL	Min	Max	Std Er	r Std Dev	CV%	QA Count
0	Negative Contr	2	5.9	-2	.994	14.79	5.2	6.6	0.7	0.9899	16.78%	0
0.024		2	6.2	3.	659	8.741	6	6.4	0.2	0.2828	4.56%	0
0.0479		2	6.35	4.	444	8.256	6.2	6.5	0.15	0.2121	3.34%	0
0.0719		2	6.55	5.	915	7.185	6.5	6.6	0.0499	9 0.0707	1.08%	0
Overall		8	6.25				5.2	6.6	 ,			0 (0%)
pH-Units												
C-%	Control Type	Count			5% LCL	95% UCL		Max	Std Er	r Std Dev	CV%	QA Count
0	Negative Contr		7.4		.389	7.411	7.4	7.4	0	0	0.0%	0
0.024		2	7.45		815	8.085	7.4	7.5	0.05	0.07072	0.95%	0
0.0479		2	7.55		915	8.185	7.5	7.6	0.05	0.07071	0.94%	0
0.0719		2	7.5	7.	.5	7.5	7.5	7.5	0	0	0.0%	0
Overail		8	7.475				7.4	7.6				0 (0%)
Salinity-ppt												
C-%	Control Type	Count			5% LCL	95% UCL	Min	Max	Std E		CV%	QA Count
0	Negative Contr		34	34		34	34	34	0	0	0.0%	0
0.024		2	34	34		34	34	34	0	0	0.0%	0
0.0479		2	34	34		34	34	34	0	0	0.0%	0
0.0719		2	34	34	4	34	34	34	0	0	0.0%	0
Overall		8	34		~	_	34	34				0 (0%)
Temperature-												
C-%	Control Type	Count			5% LCL	95% UCL		Max	Std E		CV%	QA Count
0	Negative Contr		14.4		3.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
0.024		2	14.4		3.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
0.0479		2	14.4 14.4		3.13 3.13	15.67 15.67	14.3 14.3	14.5 14.5	0.1 0.1	0.1414 0.1414	0.98% 0.98%	0
0.0719												

CETIS	Measurement	Report
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Report Date:

08 Sep-14 15:48 (p 2 of 2)

Test Code:

LTS0814.151abs I 11-6027-3066

				Test Code:	LTS0814.151abs 11-6027-3066
Red Abalo	ne Larvai Developi	ment Tes	t	Aquatic	Bloassay & Consulting Labs, Inc.
Dissolved	Oxygen-mg/L				
C-%	Control Type	1	2		
0	Negative Contr	6.6	5.2		
0.024		6.4	6		
0.0479		6.5	6.2		
0.0719		6.6	6.5		
pH-Units					
C-%	Control Type	1	2		
0	Negative Contr	7.4	7.4		
0.024		7.4	7.5		
0.0479		7.5	7.6		
0.0719		7.5	7.5		
Salinity-pp	ot				
C-%	Control Type	1	2		
0	Negative Contr	34	34		
0.024		34	34		
0.0479		34	34		
0.0719		34	34		
Temperatu	ıre-°C		· · · · · · · · · · · · · · · · · · ·		
C-%	Control Type	1	2		
0	Negative Contr	14.5	14.3		
0.024		14.5	14.3		
0.0479		14.5	14.3		
0.0719		14.5	14.3		



September 10, 2014

Freeport -McMoRan Oil & Gas Attn: Ruth Juris 201 S. Broadway Orcutt, CA 93455

Dear Ms. Juris:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995. Results were as follows:

CLIENT:

Freeport -McMoRan Oil & Gas

SAMPLE I.D.:

Produced Water Discharge (Platform Hermosa)

DATE RECEIVED:

13 Aug - 14

ABC LAB. NO.:

LTS0814.151

CHRONIC KELP GERMINATION AND GROWTH BIOASSAY

IWC CONCENTRATION = 0.0479 %

TST RESULT

Germination

PASS

Tube Length

PASS

Scott Johnson

Yours v

Laboratory Director

CETIS Summary Report

Report Date:

09 Sep-14 14:36 (p 1 of 2)

Test Code: LTS0814.151kip | 03-9930-0912

Macrocystis (Germination and	Germ Tub	e Grow	th Test				Aquatic B	ioassay & (Consulting	Labs, Inc
Batch ID:	03-6482-8871	Tes	t Type:	Growth-Germin	ation		Ana	lyst:	· · · · · ·		
tart Date:	13 Aug-14 14:0	2 Prof	tocol:	EPA/600/R-95/	136 (1995)		Dilu	ent: Rece	eiving Wate	г	
inding Date:	15 Aug-14 14:0	2 Spe	cies:	Macrocystis py	rifera		Brin	e: Not	Applicable		
ouration:	48h	Sou	rce:	Aquatic Bioass	ay Labs Coli	ection	Age				
ample ID:	07-1780-2428	Cod	le:	LTS0814.151kl	<u></u>		Clie	nt: LTS	Environme	ntal, Inc.	
ample Date:	12 Aug-14 09:0	0 Mat	erial:	Sample Water			Pro	ject:			
leceive Date	: 13 Aug-14 08:3	5 Sou	rce:	Bioassay Repo	rt						
ample Age:	29h (1.8 °C)	Stat	ion:	Platform Hermo	osa						
omparison :	Summary										
nalysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Method			
0-6237-8271	Germination Ra	ite	0.0719	>0.0719	NA	2.47%	1391	Dunnett M	ultiple Com	parison Tes	st
4-3978-1407 	Mean Length		0.0719	>0.0719	NA	4.01%	1391	Dunnett M	ultiple Com	parison Tes	st
oint Estimat	e Summary										
nalysis ID	Endpoint De		Level	<u>%</u>	95% LCL	95% UCL		Method	1		
1-3635-1271	Germination Ra	ie.	EC5	>0.0719	N/A	N/A	<1391	Linear Inte	rpolation (i	CPIN)	
			EC10	>0.0719	N/A	N/A	<1391				
			EC15	>0.0719	N/A	N/A	<1391				
			EC20	>0.0719	N/A	N/A	<1391				
			EC25	>0.0719	N/A	N/A	<1391				
			EC40	>0.0719	N/A	N/A	<1391				
			EC50	>0.0719	N/A	N/A	<1391				
6-2909-2195	Mean Length		IC5	>0.0719	N/A	N/A	<1391	Linear Inte	erpolation (I	CPIN)	
			IC10	>0.0719	N/A	N/A	<1391				
			IC15	>0.0719	N/A	N/A	<1391				
			IC20	>0.0719	N/A	N/A	<1391				
			IC25	>0.0719	N/A	N/A	<1391				
			IC40	>0.0719	N/A	N/A	<1391				
			IC50	>0.0719 ————	N/A	N/A	<1391				
est Acceptal	•								5-11		
_	Endpoint Commission Pa	to .	Attribu		Test Stat	TAC Limi	ts	Overlap	Decision	aaantahilit.	Criteria
0-6237-8271	Germination Ra		Contro	l Resp	0.924	0.7 - NL	ts	Yes	Passes A	cceptability	
0-6237-8271 1-3635-1271	Germination Ra Germination Ra		Contro	l Resp I Resp	0.924 0.924	0.7 - NL 0.7 - NL	ts	Yes Yes	Passes A	cceptability	Criteria
0-6237-8271 1-3635-1271 4-3978-1407	Germination Ra Germination Ra Mean Length		Contro Contro	l Resp I Resp I Resp	0.924 0.924 16.02	0.7 - NL 0.7 - NL 10 - NL	ts	Yes Yes Yes	Passes A Passes A Passes A	cceptability cceptability	Criteria Criteria
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195	Germination Ra Germination Ra Mean Length Mean Length	te	Contro Contro Contro	l Resp I Resp I Resp I Resp	0.924 0.924 16.02 16.02	0.7 - NL 0.7 - NL 10 - NL 10 - NL	ts	Yes Yes Yes Yes	Passes A Passes A Passes A Passes A	cceptability cceptability cceptability	Criteria Criteria Criteria
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271	Germination Ra Germination Ra Mean Length Mean Length Germination Ra	te	Contro Contro Contro Contro PMSD	l Resp I Resp I Resp I Resp	0.924 0.924 16.02 16.02 0.02468	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2	ts	Yes Yes Yes Yes No	Passes A Passes A Passes A Passes A	cceptability cceptability cceptability cceptability	Criteria Criteria Criteria Criteria
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271 4-3978-1407	Germination Ra Germination Ra Mean Length Mean Length	te	Contro Contro Contro	l Resp I Resp I Resp I Resp	0.924 0.924 16.02 16.02	0.7 - NL 0.7 - NL 10 - NL 10 - NL	ts	Yes Yes Yes Yes	Passes A Passes A Passes A Passes A	cceptability cceptability cceptability	Criteria Criteria Criteria Criteria
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271 4-3978-1407	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length	te	Contro Contro Contro Contro PMSD	l Resp I Resp I Resp I Resp	0.924 0.924 16.02 16.02 0.02468 0.04005	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2	Max	Yes Yes Yes Yes No	Passes A Passes A Passes A Passes A	cceptability cceptability cceptability cceptability cceptability	Criteria Criteria Criteria Criteria Criteria
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271 4-3978-1407 ermination F	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length	te Count	Contro Contro Contro PMSD PMSD	l Resp I Resp I Resp I Resp	0.924 0.924 16.02 16.02 0.02468 0.04005	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2 NL - 0.2		Yes Yes Yes Yes No No	Passes A Passes A Passes A Passes A Passes A	cceptability cceptability cceptability cceptability	Criteria Criteria Criteria Criteria Criteria
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271 4-3978-1407 ermination F	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length Rate Summary Control Type	te Count	Contro Contro Contro PMSD PMSD	I Resp I Resp I Resp I Resp	0.924 0.924 16.02 16.02 0.02468 0.04005	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2 NL - 0.2	Max	Yes Yes Yes Yes No No	Passes A Passes A Passes A Passes A Passes A Std Dev	cceptability cceptability cceptability cceptability cceptability cceptability CV% 1.23%	Criteria Criteria Criteria Criteria Criteria
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271 4-3978-1407 ermination F	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length Rate Summary Control Type	te Count 5	Contro Contro Contro Contro PMSD PMSD PMSD	I Resp I Resp I Resp I Resp 95% LCL 0.9098	0.924 0.924 16.02 16.02 0.02468 0.04005 95% UCL 0.9382	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2 NL - 0.2	Max 0.94	Yes Yes Yes Yes No No Std Err 0.005099	Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Std Dev 0.0114	cceptability cceptability cceptability cceptability cceptability	Criteria Criteria Criteria Criteria Criteria Criteria **Effect** 0.0%
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271 4-3978-1407 remination F	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length Rate Summary Control Type	Count 5	Contro Contro Contro PMSD PMSD Mean 0.924 0.934	I Resp I Resp I Resp I Resp 95% LCL 0.9098 0.9198	0.924 0.924 16.02 16.02 0.02468 0.04005 95% UCL 0.9382 0.9482	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2 NL - 0.2 Min 0.91	Max 0.94 0.95	Yes Yes Yes No No Std Err 0.005099 0.005099	Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Std Dev 0.0114 0.0114	cceptability cceptability cceptability cceptability cceptability cceptability CV% 1.23% 1.22%	Criteria Criteria Criteria Criteria Criteria Criteria Criteria **Effect 0.0% -1.08%
0-6237-8271 1-3635-1271 1-3978-1407 6-2909-2195 0-6237-8271 1-3978-1407 ermination F -% 024 0479 0719	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length Rate Summary Control Type Negative Control	Count 5 5 5 5 5	Contro Contro Contro PMSD PMSD Mean 0.924 0.934	I Resp I Resp I Resp I Resp I Resp 95% LCL 0.9098 0.9198 0.9083	0.924 0.924 16.02 16.02 0.02468 0.04005 95% UCL 0.9382 0.9482 0.9597	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2 NL - 0.2 Min 0.91 0.92 0.91	Max 0.94 0.95 0.96	Yes Yes Yes No No Std Err 0.005099 0.005099 0.009274	Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Std Dev 0.0114 0.02074	cceptability cceptability cceptability cceptability cceptability cceptability CV% 1.23% 1.22% 2.22%	Criteria Criteria Criteria Criteria Criteria Criteria **Effect 0.0% -1.08% -1.08%
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271 4-3978-1407 ermination F -% 024 0479 0719	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length Rate Summary Control Type Negative Control Summary Control Type	Count 5 5 5 5 Count	Contro Contro Contro Contro PMSD PMSD Mean 0.924 0.934 0.936	I Resp I Resp I Resp I Resp I Resp 95% LCL 0.9098 0.9198 0.9083 0.9218	0.924 0.924 16.02 16.02 0.02468 0.04005 95% UCL 0.9382 0.9482 0.9597 0.9502	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2 NL - 0.2 NL - 0.2 Min 0.91 0.92 0.91 0.92	Max 0.94 0.95 0.96 0.95	Yes Yes Yes No No Std Err 0.005099 0.005099 0.005099 Std Err	Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Std Dev 0.0114 0.02074 0.0114	cceptability cceptability cceptability cceptability cceptability cceptability cceptability 1.23% 1.22% 1.22% CV%	Criteria Criteria Criteria Criteria Criteria **Effec 0.0% -1.08% -1.3% **Effec
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271 4-3978-1407 fermination F % 024 0479 0719	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length Rate Summary Control Type Negative Control	Count 5 5 5 5 Count 5	Contro Contro Contro PMSD PMSD Mean 0.924 0.934 0.936 Mean 16.02	95% LCL 0.9083 0.9218	0.924 0.924 16.02 16.02 0.02468 0.04005 95% UCL 0.9382 0.9482 0.9597 0.9502 95% UCL 16.74	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2 NL - 0.2 NL - 0.2 Min 0.91 0.92 0.91 0.92 Min 15.5	Max 0.94 0.95 0.96 0.95	Yes Yes Yes No No Std Err 0.005099 0.005099 0.005099 Std Err 0.2596	Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Std Dev 0.0114 0.02074 0.0114 Std Dev 0.5805	cceptability cceptability cceptability cceptability cceptability cceptability cceptability cceptability cceptability cceptability 1.23% 1.22% 2.22% 1.22% CV% 3.62%	Criteria Criteria Criteria Criteria Criteria **Effect* 0.0% -1.08% -1.3% **Effect* 0.0%
0-6237-8271 1-3635-1271 4-3978-1407 6-2909-2195 0-6237-8271 4-3978-1407 6-mination F 3-% 024 0479 0719 Jean Length	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length Rate Summary Control Type Negative Control Summary Control Type	Count 5 5 5 5 Count 5 5 5	Contro Contro Contro PMSD PMSD Mean 0.924 0.934 0.936 Mean 16.02 16.48	95% LCL 0.9083 0.9218 95% LCL	0.924 0.924 16.02 16.02 0.02468 0.04005 95% UCL 0.9382 0.9482 0.9597 0.9502 95% UCL 16.74 17.03	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2 NL - 0.2 Min 0.91 0.92 0.91 0.92 Min 15.5	Max 0.94 0.95 0.96 0.95 Max 16.7 17.1	Yes Yes Yes Yes No No Std Err 0.005099 0.005099 0.005099 Std Err 0.2596 0.1985	Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Std Dev 0.0114 0.02074 0.0114 Std Dev 0.5805 0.4438	cceptability cceptability cceptability cceptability cceptability cceptability cceptability cceptability cceptability cceptability 1.23% 1.22% 1.22% 1.22% CV% 3.62% 2.69%	Criteria Criteria Criteria Criteria Criteria **Effec** 0.0% -1.08% -1.08% -1.3% **Effec** 0.0% -2.87%
.024 .0479 .0719	Germination Ra Germination Ra Mean Length Mean Length Germination Ra Mean Length Rate Summary Control Type Negative Control Summary Control Type	Count 5 5 5 5 Count 5	Contro Contro Contro PMSD PMSD Mean 0.924 0.934 0.936 Mean 16.02	95% LCL 0.9083 0.9218	0.924 0.924 16.02 16.02 0.02468 0.04005 95% UCL 0.9382 0.9482 0.9597 0.9502 95% UCL 16.74	0.7 - NL 0.7 - NL 10 - NL 10 - NL NL - 0.2 NL - 0.2 NL - 0.2 Min 0.91 0.92 0.91 0.92 Min 15.5	Max 0.94 0.95 0.96 0.95	Yes Yes Yes No No Std Err 0.005099 0.005099 0.005099 Std Err 0.2596	Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Passes Ar Std Dev 0.0114 0.02074 0.0114 Std Dev 0.5805	cceptability cceptability cceptability cceptability cceptability cceptability cceptability cceptability cceptability cceptability 1.23% 1.22% 2.22% 1.22% CV% 3.62%	Criteria Criteria Criteria Criteria Criteria **Effect* 0.0% -1.08% -1.08% -1.3% **Effect* 0.0%

CETIS Summary Report

Report Date:

09 Sep-14 14:36 (p 2 of 2)

Test Code:

LTS0814.151klp | 03-9930-0912

is Germination and	Germ Tu	be Growth	Test			Aquatic Bloassay & Consulting Labs, inc
on Rate Detail						
Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
Negative Control	0.94	0.92	0.93	0.91	0.92	
	0.93	0.95	0.92	0.93	0.94	
	0.95	0.96	0.92	0.93	0.91	
	0.93	0.94	0.95	0.92	0.94	
gth Detail		<u>-</u>				
Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
Negative Control	16.7	15.7	15.5	16.6	15.6	
	16.6	17.1	16.6	16	16.1	
	15.7	16.5	16.6	15.9	16	
	16.3	15.9	15.8	16.6	16.6	
on Rate Binomials						
Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
Negative Control	94/100	92/100	93/100	91/100	92/100	
	93/100	95/100	92/100	93/100	94/100	
	95/100	96/100	92/100	93/100	91/100	
	93/100	94/100	95/100	92/100	94/100	
	con Rate Detail Control Type Negative Control gth Detail Control Type Negative Control on Rate Binomials Control Type	Control Type Rep 1 Negative Control 0.94 0.93 0.95 0.93 Qth Detail Control Type Rep 1 Negative Control 16.7 16.6 15.7 16.3 On Rate Binomials Control Type Rep 1 Negative Control 94/100 93/100 95/100	Control Type Rep 1 Rep 2 Negative Control 0.94 0.95 0.95 0.95 0.96 0.93 0.94 Qth Detail Control Type Rep 1 Rep 2 Negative Control 16.7 15.7 16.6 17.1 15.7 16.5 16.3 15.9 On Rate Binomials Control Type Rep 1 Rep 2 Negative Control 94/100 92/100 93/100 95/100 96/100	Control Type Rep 1 Rep 2 Rep 3 Negative Control 0.94 0.92 0.93 0.93 0.95 0.92 0.95 0.96 0.92 0.93 0.94 0.95 gth Detail Control Type Rep 1 Rep 2 Rep 3 Negative Control 16.7 15.7 15.5 16.6 17.1 16.6 15.7 16.5 16.6 16.3 15.9 15.8 15.8 15.8 On Rate Binomials Control Type Rep 1 Rep 2 Rep 3 Negative Control 94/100 92/100 93/100 93/100 95/100 92/100 95/100 96/100 92/100	Control Type Rep 1 Rep 2 Rep 3 Rep 4 Negative Control 0.94 0.92 0.93 0.91 0.93 0.95 0.92 0.93 0.95 0.96 0.92 0.93 0.93 0.94 0.95 0.92 Oth Detail Control Type Rep 1 Rep 2 Rep 3 Rep 4 Negative Control 16.7 15.7 15.5 16.6 16.6 17.1 16.6 16 15.7 16.5 16.6 15.9 16.3 15.9 15.8 16.6 On Rate Binomials Control Type Rep 1 Rep 2 Rep 3 Rep 4 Negative Control 94/100 92/100 93/100 91/100 93/100 95/100 92/100 93/100 95/100 96/100 92/100 93/100	Control Type Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Negative Control 0.94 0.92 0.93 0.91 0.92 0.93 0.95 0.92 0.93 0.91 0.95 0.96 0.92 0.93 0.91 0.93 0.94 0.95 0.92 0.93 0.94 Other Detail Control Type Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Negative Control 16.7 15.7 15.5 16.6 15.6 16.6 17.1 16.6 16 16.1 15.7 16.5 16.6 15.9 16 16.3 15.9 15.8 16.6 16.6 On Rate Binomials Control Type Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Negative Control 94/100 92/100 93/100 91/100 92/100 93/100 95/100 95/100 92/100 93/100 91/100

Report Date:

09 Sep-14 14:36 (p 1 of 4)

Test Code:

LTS0814.151klp | 03-9930-0912

							lest	Code:	L150814.	151KIP U	3-9930-09
Macrocystis	Germination and	Germ Tub	e Growth 1	Test				Aquatic B	ioassay & C	onsulting	g Labs, In
Analysis ID: Analyzed:	10-6237-8271 09 Sep-14 14:3			ermination Ra rametric-Cor		tments		IS Version: cial Results:	CETISv1.	8.7	
Sample ID:	07-1780-2428	Coc	le: LT	S0814.151kl	p		Clie	nt: LTS	Environmen	tal, Inc.	
•	: 12 Aug-14 09:0	0 Mat		mple Water			Proj			,	
Receive Date	: 13 Aug-14 08:3	5 So u		assay Repo	rt		•				
Sample Age:	29h (1.8 °C)	Stat		atform Hermo							
Data Transfo		Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	TU
Angular (Com		NA	C>T	NA NA	NA		2.47%	0.0719	>0.0719	NA	1391
Dunnett Mult	iple Comparison	Test									
Control	vs C-%		Test Stat	Critical	MSD DF	P-Value	P-Type	Decision(α:5%)		
Negative Con	trol 0.024		-1.065	2.227	0.041 8	0.9673	CDF	Non-Signif	icant Effect		
	0.0479		-1.165	2.227	0.041 8	0.9741	CDF	Non-Signif	icant Effect		
	0.0719		-1.285	2.227	0.041 8	0.9807	CDF	Non-Signif	icant Effect		
NOVA Table	•										
Source	Sum Squa		Mean Sq		DF	F Stat	P-Value	Decision(
Between	0.0017908	49	0.000596	9495	3	0.7025	0.5643	Non-Signif	icant Effect		
Error	0.0135963		0.000849	7711	16	_					
Γotal	0.0153871	9			19						
Distributiona	l Tests										
Attribute	Test			Test Stat	Critical	P-Value	Decision	(α:1%)			
/ariances	Bartlett Ed	quality of Va	ariance	2.57	11.34	0.4628	Equal Va	riances			
/ariances			of Variance	9 1.507	5.953	0.2629	Equal Va	riances			
/ariances		quality of V		2.163	5.292	0.1323	Equal Va	riances			F.
Distribution	•	Vilk W Norn	•	0.9641	0.866	0.6287	Normal D	istribution			T.
Distribution	_	ov-Smirnov		0.1685	0.2235	0.1426	Normal D	istribution			
Distribution	-	o Skewnes:	8	0.594	2.576	0.5525		istribution			
Distribution	D'Agostin			0.3603	2.576	0.7186		istribution			
Distribution	-		K2 Omnibu:		9.21	0.7856		istribution			
Distribution	Anderson-	-Darling A2	Normality	0.4092	3.878	0.3495	Normal D	istribution			
	Rate Summary			<i>to</i>				91			
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effec
)).02 4	Negative Control	5	0.924 0.934	0.9098 0.9198	0.9382 0.9482	0.92 0.93	0.91 0.92	0.94	0.005099	1.23%	0.0%
).02 4).0479		5	0.934	0.9083	0.9462	0.93		0.95 0.96	0.005099	1.22% 2.22%	-1.08%
0.0479		5	0.936	0.9218	0.9597	0.93	0.91 0.92	0.96	0.009274 0.005099		-1.08% -1.3%
· · · · · · · · · · · · · · · · · · ·	rected) Transform										-1.370
	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effec
)	Negative Contr	5	1.292	1.265	1.319	1.284	1.266	1.323	0.009748	1.69%	0.0%
).024		5	1.312	1.283	1.341	1.303	1.284	1.345	0.01044	1.78%	-1.52%
0.0479		5	1.314	1.26	1.367	1.303	1.266	1.369	0.01919	3.27%	-1.66%
0.0719		5	1.316	1.287	1.345	1.323	1.284	1.345	0.01038	1.76%	-1.83%
	D-4D-4-11										
ermination	Rate Detail										
	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
C-%	Control Type	Rep 1	Rep 2 0.92	Rep 3 0.93	Rep 4 0.91	Rep 5 0.92	***				
Germination (C-%)		0.94	0.92	0.93	0.91	0.92					
C-%	Control Type										

Analyst:_____QA:____

Report Date:

09 Sep-14 14:36 (p 2 of 4)

Test Code:

LTS0814.151klp | 03-9930-0912

Macrocystis	Germination	and Germ	Tube	Growth Test
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Aquatic Bloassa	y &	Consu	iting	Labs,	Inc.
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Analysis ID:	10-6237-8271	Endpoint:	Germination Rate		CETIS Version:	CETISv1.8.7
Analyzed:	09 Sep-14 14:36	Anaiysis:	Parametric-Control vs Treatments	y.	Official Results:	Yes

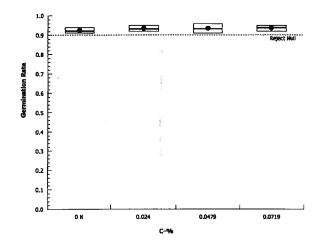
Angular (Corrected) Transformed Detail

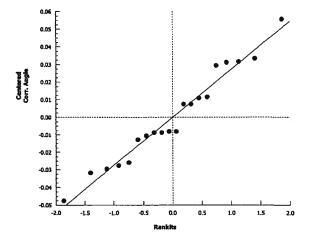
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Negative Control	1.323	1.284	1.303	1.266	1.284	
0.024		1.303	1.345	1.284	1.303	1.323	
0.0479		1.345	1.369	1.284	1.303	1.266	
0.0719		1.303	1.323	1.345	1.284	1.323	

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	94/100	92/100	93/100	91/100	92/100
0.024		93/100	95/100	92/100	93/100	94/100
0.0479		95/100	96/100	92/100	93/100	91/100
0.0719		93/100	94/100	95/100	92/100	94/100

Graphics





Analyst:____QA:___

Report Date:

09 Sep-14 14:36 (p 3 of 4)

Test Code:

LTS0814.151klp | 03-9930-0912

							Test	Code:	LTS0814	.151klp 0	3-9930-091
Macrocystis (Sermination and	Germ	Tube Growth	n Test				Aquatic	Bioassay &	Consulting	Labs, Inc
Analysis ID:	04-3978-1407		Endpoint:	Mean Length			CET	S Version	: CETISv1	.8.7	
Analyzed:	09 Sep-14 14:3	6	Analysis: F	Parametric-Cor	trol vs Treat	tments	Offic	ial Results	: Yes		
Sample ID:	07-1780-2428		Code: 1	TS0814.151kl	n		Clier	nt: LTS	S Environme	ntal. Inc.	
-	12 Aug-14 09:0	0		Sample Water			Proje				
Receive Date:	: 13 Aug-14 08:3	5	Source: E	Bioassay Repo	rt		•				
Sample Age:	-		Station:	Platform Hermo	sa						
Data Transfor	m	Zeta	Alt Hy	p Trials	Seed		PMSD	NOEL	LOEL	TOEL	TU
Untransformed	i	NA	C > T	NA	NA		4.01%	0.0719	>0.0719	NA	1391
Dunnett Multi	ple Comparison	Test								_	
Control	vs C-%		Test St	at Critical	MSD DF	P-Value	P-Type	Decision	(α:5%)		
Negative Cont	rol 0.024		-1.597	2.227	0.642 8	0.9912	CDF	Non-Sign	ificant Effect	_	
	0.0479		-0.4165	2.227	0.642 8	0.8732	CDF	Non-Sign	ificant Effect	t	
	0.0719		-0.7636	2.227	0.642 8	0.9360	CDF	Non-Sigr	ificant Effect	t	
ANOVA Table											
Source	Sum Squa	res	Mean S		DF	F Stat	P-Value	Decision	ı(α:5%)	·	
Between	0.5720003		0.19066		3	0.9189	0.4540	Non-Sigr	ificant Effect		
Error	3.320003		0.20750	002	16	_					
Total	3.892003				19						
Distributional											
Attribute	Test	***		Test Stat	Critical	P-Value	Decision	`			
Variances			of Variance	0.8838	11.34	0.8293	Equal Vai				
Variances			ality of Variar		5.953	0.8071	Equal Vai				
Variances Distribution	Shapiro-W		of Variance	1.46 0.8922	5.292 0.866	0.2628 0.0295	Equal Va				
Distribution	Kolmogore		•	0.0922	0.2235	0.0295	Normal D Normal D				
Distribution	D'Agostino			0.173	2.576	0.5638	Normal D				
Distribution	D'Agostino			2.647	2.576	0.0081		ial Distribul	ion		
Distribution	•		son K2 Omnit		9.21	0.0255	Normal D		ion		
Distribution	•		g A2 Normalit		3.878	0.0210	Normal D				
Mean Length	Summary			·····						_	-
C-%	Control Type	Coun		95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control		16.02	15.3	16.74	15.7	15.5	16.7	0.2596	3.62%	0.0%
0.024		5	16.48	15.93	17.03	16.6	16	17.1	0.1985	2.69%	-2.87%
0.0479		5	16.14	15.65	16.63	16	15.7	16.6	0.1749	2.42%	-0.75%
0.0719		5	16.24	15.77	16.71	16.3	15.8	16.6	0.1691	2.33%	-1.37%
Mean Length											
	Control Type	Rep 1		Rep 3	Rep 4	Rep 5			 .		
	Negative Control		15.7	15.5	16.6	15.6					
0.024		16.6	17.1	16.6	16	16.1					
0.0479		15.7	16.5	16.6	15.9	16					
0.0719		16.3	15.9	15.8	16.6	16.6					

Analyst: QA:

Report Date:

09 Sep-14 14:36 (p 4 of 4)

Test Code:

LTS0814.151klp | 03-9930-0912

Macrocystis Germination and Germ Tube Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

04-3978-1407 09 Sep-14 14:36

E

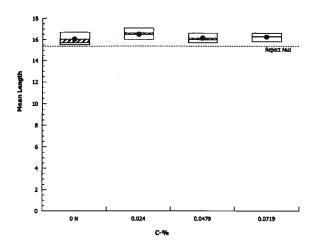
Endpoint: Mean Length **Analysis:** Parametric-Co

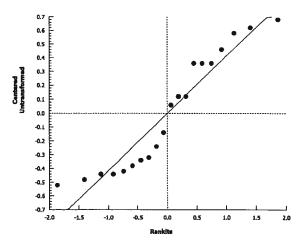
Parametric-Control vs Treatments

CETIS Version: CET
Official Results: Yes

CETISv1.8.7

Graphics





Report Date:

09 Sep-14 14:36 (p 1 of 3)

Test Code:

LTS0814.151klp | 03-9930-0912

									lest	,oue:	L100014	F. IO IKIP [02-8820-0815
Macroc	ystis G	ermination and	d Germ Tub	e Grow	th Test				_	Aquatic E	Bioassay &	Consultir	g Labs, Inc.
Anaiysi	s ID:	21-3635-1271	Enc	lpoint:	Germination Ra	ate			CETIS	Version:	CETISv1	.8.7	
Analyze		09 Sep-14 14:3		lysis:	Linear Interpola	ation (ICPIN))	ı	Officia	al Results			
Sample	D:	07-1780-2428	Cod	le: LTS0814.151kip					Client	: LTS	Environme	ntal, Inc.	
Sample	Date:	12 Aug-14 09:0	00 Ma 1	erial:	Sample Water			1	Projec	ct:			
Receive	Date:	13 Aug-14 08:3	35 Sο ι	ırce:	Bioassay Repo	rt							
Sample	Age:	29h (1.8 °C)	Sta	tion:	Platform Hermo	osa						_	
Linear I	nterpol	ation Options											··
X Trans	form	Y Transform	n See	d	Resamples	Exp 95%	CL Met	hod					
Linear		Linear	0		280	Yes	Two	-Point Ir	nterpo	lation			
Point E	stimate	8					_						
Level	%	95% LCL	95% UCL		95% LCL								
EC5	>0.071		N/A	<139°		NA							
EC10	>0.071		N/A	<139		NA							
EC15	>0.071		N/A	<139		NA							
EC20	>0.071		N/A	<139		NA							
EC25	>0.071		N/A	<139°		NA							
EC40	>0.071		N/A	<139		NA							
EC50	>0.071	9 N/A	N/A 	<139	1 NA	NA							
Germin	ation Ra	ate Summary				Calcu	lated Varia	ate(A/B)				-	
C-%		ntroi Type	Count	Mean	Min	Max	Std Err	Std [Dev	CV%	%Effect	Α	В
0	Ne	gative Control	5	0.924		0.94	0.005099	0.011	4	1.23%	0.0%	462	500
0.024		4	5	0.934	0.92	0.95	0.005099	0.011	4	1.22%	-1.08%	467	500
0.0479		1	5	0.934		0.96	0.009274			2.22%	-1.08%	467	500
0.0719			5	0.936	0.92	0.95	0.005099	0.011	4	1.22%	-1.3%	468	500
Germin	ation Ra	ate Detail											
C-%		ntrol Type	Rep 1	Rep 2		Rep 4	Rep 5						
0	Ne	gative Control	0.94	0.92	0.93	0.91	0.92						
0.024			0.93	0.95	0.92	0.93	0.94						
0.0479			0.95	0.96	0.92	0.93	0.91						
0.0719			0.93	0.94	0.95	0.92	0.94						
Germina	ation Ra	ate Binomials						_					<u> </u>
C-%		ontrol Type	Rep 1	Rep 2		Rep 4	Rep 5						
)	N	legative Contro	I 94/100	92/10	0 93/100	91/100	92/100						
0.024			93/100	95/10	0 92/100	93/100	94/100						
0.0479			95/100	96/10	0 92/100	93/100	91/100						
0.0719			93/100	94/10	0 95/100	92/100	94/100						

Report Date:

09 Sep-14 14:36 (p 2 of 3)

Test Code:

LTS0814.151klp | 03-9930-0912

Macrocystis Germination and Germ Tube Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

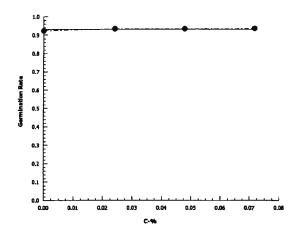
21-3635-1271 09 Sep-14 14:36

Endpoint: Germination Rate

Analysis: Linear Interpolation (ICPIN)

CETIS Version: **CETISv1.8.7** Official Results: Yes

Graphics



Report Date:

09 Sep-14 14:36 (p 3 of 3)

Test Code:

LTS0814.151klp | 03-9930-0912

Macro	cystis Ge	rmination and	Germ Tub	e Grow	th Test			Aq	uatic Bi	oassay & Consulting Labs, Inc.
Analys	is ID:	16-2909-2195	End	point:	Mean Length			CETIS Ve	rsion:	CETISv1.8.7
Analyz	ed:	0 <mark>9 Sep-14 14:</mark> 3	6 Ana	lysis:	Linear Interpola	ition (ICPIN)		Official R	esults:	Yes
Sample	e ID:	07-1780-2428	Cod	e:	LTS0814.151kl	p	.,	Client:	LTS	Environmental, Inc.
Sample	e Date:	12 Aug-14 09:0	0 Mate	erial:	Sample Water			Project:		
Receiv	e Date:	13 Aug-14 08:3	5 Sou	rce:	Bioassay Repo	rt		_		
Sample	e Age: 2	29h (1.8 °C)	Stat	lon:	Platform Hermo	sa				
Linear	Interpola	tion Options	U-0				**			
X Trans	sform	Y Transform	See	d	Resamples	Exp 95% CL	Method			
Linear		Linear	1733	034	280	Yes	Two-Point	Interpolation	n	
Point E	stimates					· · · · · · · · · · · · · · · · · · ·				
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL				
IC5	>0.071	9 N/A	N/A	<1391	NA	NA				
IC10	>0.071	9 N/A	N/A	<1391	NA.	NA				

Mean Length Summary			Calculated Variate							
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	
0	Negative Control	5	16.02	15.5	16.7	0.2596	0.5805	3.62%	0.0%	1000
0.024		5	16.48	16	17.1	0.1985	0.4438	2.69%	-2.87%	3.33
0.0479		5	16.14	15.7	16.6	0.1749	0.3911	2.42%	-0.75%	Ger
0.0719		5	16.24	15.8	16.6	0.1691	0.3781	2.33%	-1.37%	

NA

NA

NA

NA

NA

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	16.7	15.7	15.5	16.6	15.6
0.024		16.6	17.1	16.6	16	16.1
0.0479		15.7	16.5	16.6	15.9	16
0.0719		16.3	15.9	15.8	16.6	16.6

Graphics

IC15

IC20

IC25

IC40

IC50

>0.0719

>0.0719

>0.0719

>0.0719

>0.0719

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

N/A

<1391

<1391

<1391

<1391

<1391

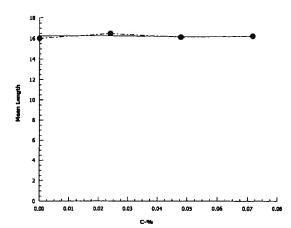
NA

NA

NA

NA

NA



CETIS Measurement Report

Report Date:

09 Sep-14 14:36 (p 1 of 2)

Test Code:

LTS0814.151klp | 03-9930-0912

g Wate	ter	ng Labs, Inc.
icable		
icable		
ironm	ental, Inc.	
ironm	ental, Inc.	
		-
Dev	CV%	QA Count
357	8.84%	0
828	4.42%	0
536	5.4%	0
707	1.08%	0
		0 (0%)
		- <u></u>
Dev	CV%	QA Count
	0.0%	0
	0.0%	0
	0.0%	0
7073	0.88%	0
		0 (0%)
Dev	CV%	QA Count
	0.0%	0
	0.0%	0
	0.0%	0
	0.0%	0
		0 (0%)
Dev	CV%	QA Count
7075	0.48%	0
7075	0.48%	0
7075	0.48%	0
7075	0.48%	0
	<u>-</u>	0 (0%)
	d Dev 657 828 536 707 d Dev 17073 d Dev 17075 17075 17075	657 8.84% 828 4.42% 536 5.4% 707 1.08% 1 Dev CV% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.

CETIS Measurement Report

Report Date:

09 Sep-14 14:36 (p 2 of 2)

Test Code:

LTS0814.151klp | 03-9930-0912

					1031.0	oue.	E100014.10	1 40-02-23
Macrocyst	is Germination and	i Germ T	ube Growth Test	***		Aquatic B	oassay & Con	sulting Labs, Inc.
Dissolved	Oxygen-mg/L							
C-%	Control Type	1	2					
0	Negative Contr	6.8	6					
0.024		6.6	6.2					
0.0479		6.8	6.3					
0.0719		6.6	6.5					
pH-Units								
C-%	Control Type	1	2					
0	Negative Contr	7.9	7.9			••		
0.024		8	8					
0.0479		8	8					
0.0719	*	8	8.1					
Salinity-pp	t							
C-%	Control Type	1	2					
0	Negative Contr	34	34					
0.024		34	34					
0.0479		34	34					
0.0719		34	34					
Temperatu	re-°C							
C-%	Control Type	1	2	19				
0	Negative Contr	14.7	14.8	9	-			
0.024		14.7	14.8					
0.0479		14.7	14.8	16				
0.0719		14.7	14.8	;				

Sheet4

LTS Er	nvironmental, Inc.	Report to	D:	FM O&G		Bill to:	FM O&G
704 Ad	lirondack Avenue			Ruth Juris		=	700 Milam, Suite 3100
Vent	tura, CA 93003			201 S Broadway			Houston, Tx 77002
	05-644-4560	**	,	Orcutt, Ca 93455			
FACILITY:	Platform I	lermosa		<u> </u>		SUBMITTED TO: ABC	Lab
COLLECTOR:	: LTS/					REPORT TO: George Folks	
PROJECT/CH	ARGE# Quarterly	NPDES 3-sp	ecies Toxic	city	****		FAX:
RESULTS RE	QUIRED: normal	841				COPIES TO: Steve Law	
RESULTS BY	/: PHONE:	FAX:				Supervisor PHONE:	
) Ruth Juris
SAMPLE	SAMPLE ID/LOCATION	GRAB/	VOLUME	DATE/TIME	PRESERV.	ANALYSE	S REQUESTED (METHOD)
NO.		COMP.		COLLECTED		Dad Abalana I aras	
	Produced Water		4	8.11-12.14	100	Red Abalone - Larval	
1	Discharge	Comp	1 quart	1200 - 900	ICE		tion & germ tube length
_		120				Top Smelt - Larval su	
				8			. 6479
	20					1.8.	0719
	¥		770			0.5 x IWC =	. 0240
				100			
		ļI				Composite times /0 h	our intervale):
					125	Composite times (3-h	our mervals):
<u>-</u>			8		2	1200 - 9am	1200/1500/1800
						2/00	0/000/300/600/
	3 (94	200
55							et
Comments:			#				11
Dell'amidia di	$\overline{}$			2 4 4	25		
Relinquished	Dy: (A	47		8.13-14	Relinquished		Date:
Received by:			Time:	835	Received by:		Time:
Relinquished I	hur I	·	B+ -		n		
Relinquished li Received by:	uy.		Date:		Relinquished		Date:
neceived by:			Time:		Received by:	· · · · · · · · · · · · · · · · · · ·	Time:

PEM = 1.8°C CHOGENE = 20.1 Ammodian >W



CHRONIC TOPSMELT SURVIVAL AND GROWTH BIOASSAY

DATE:

12 August - 2014

STANDARD TOXICANT: Copper Chloride

ENDPOINT:

SURVIVAL

NOEC =

56.00 ug/l

EC25 =

79.10 ug/l

EC50 =

109.20 ug/l

ENDPOINT:

GROWTH

NOEC =

56.00 ug/l

IC25 =

90.90 ug/l

IC50 =

122.70 ug/l

Yours very truly,

Scott Johnson

Laboratory Director

CETIS Summary Report

Report Date:

03 Sep-14 15:15 (p 1 of 2)

Test Code:

TOPS081214 | 18-1465-5774

elt 7-d Survival											
	and Grov	vth Test					Aqua	ıtic Bi	oassay & (Consulting	Labs, Ind
02-4919-6208	Te	st Type:	Growth-Surviva	l (7d)	_		Analyst:				
12 Aug-14 14:59) Pro	otocol:	EPA/600/R-95/	136 (1995)			Diluent:	Labo	ratory Seav	vater	
19 Aug-14 13:00	Sp.	ecies:	Atherinops affir				Brine:		Applicable		
6d 22h	-	urce:	-				Age:		, ,		
08-4869-1228	Co	de:	TOPS081214		· · ·		Client:	ABC	Labs		
12 Aug-14 14:59	Ma	terial:	Copper chloride	•			Project:	REF	TOX		
_	So	urce:	Reference Tox	cant			•				
NA	Sta	tion:	REF TOX								
ummary							_	***			
Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Meth	od			
7d Survival Rate		56	100	74.83	11.7%		Dunn	ett Mu	ultiple Com	parison Tes	t
Mean Dry Bioma	ss-mg	56	100	74.83	17.4%		Dunn	ett M	ultiple Com	parison Tes	t
Summary											
Endpoint		Level				TU					
7d Survival Rate							Linea	ar Inte	rpolation (lo	CPIN)	
				69.95							
Mean Dry Bioma	ss-mg						Linea	ar Inte	rpolation (I	CPIN)	
		IC50	122.7	107.5	133.9						
lity											
Endpoint						ts		lap			
			•								
			•								
•	-		•							-	
•	ss-mg		•				Yes				
							No				
•	ss-mg	PMSD		0.1738	NL - 0.5		No	_	Passes A	cceptability	Criteria ———
te Summary											
•				A MOJ				_	A		
Control Type	Count	Mean		****	Min	Max		Err	Std Dev	CV%	
Control Type	5	1	1	1	1	1	0	Err	0	0.0%	0.0%
Control Type Negative Control	5 5	1 0.96	1 0.8489	1	1 0.8	1	0 0.04	Err	0 0.08944	0.0% 9.32%	0.0% 4.0%
Control Type Negative Control	5 5 5	1 0.96 0.56	1 0.8489 0.4489	1 1 0.6711	1 0.8 0.4	1 1 0.6	0 0.04 0.04	Err	0 0.08944 0.08944	0.0% 9.32% 15.97%	0.0% 4.0% 44.0%
Control Type Regative Control	5 5 5 5	1 0.96 0.56 0.04	1 0.8489 0.4489 0	1 1 0.6711 0.1511	1 0.8 0.4 0	1 1 0.6 0.2	0 0.04 0.04 0.04	Err	0 0.08944 0.08944 0.08944	0.0% 9.32%	0.0% 4.0% 44.0% 96.0%
Control Type Negative Control	5 5 5 5 5	1 0.96 0.56 0.04 0	1 0.8489 0.4489 0	1 1 0.6711 0.1511	1 0.8 0.4 0	1 1 0.6 0.2 0	0 0.04 0.04 0.04 0	Err	0 0.08944 0.08944 0.08944	0.0% 9.32% 15.97%	0.0% 4.0% 44.0% 96.0% 100.0%
Control Type Negative Control	5 5 5 5 5 5	1 0.96 0.56 0.04	1 0.8489 0.4489 0	1 1 0.6711 0.1511	1 0.8 0.4 0	1 1 0.6 0.2	0 0.04 0.04 0.04	Err	0 0.08944 0.08944 0.08944	0.0% 9.32% 15.97%	0.0% 4.0% 44.0% 96.0% 100.0%
Control Type Negative Control	5 5 5 5 5 5 5 5	1 0.96 0.56 0.04 0	1 0.8489 0.4489 0 0	1 1 0.6711 0.1511 0	1 0.8 0.4 0 0	1 1 0.6 0.2 0 0	0 0.04 0.04 0.04 0		0 0.08944 0.08944 0.08944 0	0.0% 9.32% 15.97% 223.6%	0.0% 4.0% 44.0% 96.0% 100.0%
Control Type Negative Control Negative Control Summa Control Type	5 5 5 5 5 5 5 cry	1 0.96 0.56 0.04 0 0	1 0.8489 0.4489 0 0 0	1 1 0.6711 0.1511 0 0	1 0.8 0.4 0 0 0	1 1 0.6 0.2 0 0	0 0.04 0.04 0.04 0 0	Err	0 0.08944 0.08944 0.08944 0 0	0.0% 9.32% 15.97% 223.6%	0.0% 4.0% 44.0% 96.0% 100.09
Control Type Regative Control Regative Summa Control Type Regative Control	5 5 5 5 5 5 5 Count	1 0.96 0.56 0.04 0 0 Mean 1.152	1 0.8489 0.4489 0 0 0 0 95% LCL	1 1 0.6711 0.1511 0 0 95% UCL 1.317	1 0.8 0.4 0 0 0 0 0	1 1 0.6 0.2 0 0	0 0.04 0.04 0.04 0 0	Err 95	0 0.08944 0.08944 0.08944 0 0 Std Dev 0.133	0.0% 9.32% 15.97% 223.6% CV%	0.0% 4.0% 44.0% 96.0% 100.09 100.09
Control Type Regative Control Regative Summa Control Type Regative Control	5 5 5 5 5 5 5 Count 5	1 0.96 0.56 0.04 0 0 Mean 1.152 1.358	1 0.8489 0.4489 0 0 0 0 95% LCL 0.9868 1.107	1 1 0.6711 0.1511 0 0 95% UCL 1.317 1.61	1 0.8 0.4 0 0 0 0 0 0 Min 0.988 1.128	1 0.6 0.2 0 0 0	0 0.04 0.04 0.04 0 0 0 8 Std I 98 0.055	Err 95 056	0 0.08944 0.08944 0 0 0 Std Dev 0.133 0.2025	0.0% 9.32% 15.97% 223.6% CV% 11.55% 14.91%	0.0% 4.0% 44.0% 96.0% 100.09 100.09 %Effe 0.0% -17.92
Control Type Negative Control Nass-mg Summa Control Type Negative Control	5 5 5 5 5 5 5 Count 5 5	1 0.96 0.56 0.04 0 0 Mean 1.152 1.358 0.8596	1 0.8489 0.4489 0 0 0 0 95% LCL 0.9868 1.107 6 0.7165	1 1 0.6711 0.1511 0 0 95% UCL 1.317 1.61 1.003	1 0.8 0.4 0 0 0 0 0 0 Min 0.988 1.128 0.678	1 0.6 0.2 0 0 Max 1.29 1.57	0 0.04 0.04 0.04 0 0 0 8 Std I 98 0.05: 74 0.09(3	Err 95 056 155	0 0.08944 0.08944 0.08944 0 0 Std Dev 0.133 0.2025 0.1153	0.0% 9.32% 15.97% 223.6% CV% 11.55% 14.91% 13.41%	0.0% 4.0% 44.0% 96.0% 100.0% 100.0% -17.92 25.38%
Control Type Regative Control Rass-mg Summa Control Type Regative Control	5 5 5 5 5 5 5 Count 5	1 0.96 0.56 0.04 0 0 Mean 1.152 1.358	1 0.8489 0.4489 0 0 0 0 95% LCL 0.9868 1.107	1 1 0.6711 0.1511 0 0 95% UCL 1.317 1.61	1 0.8 0.4 0 0 0 0 0 0 Min 0.988 1.128	1 0.6 0.2 0 0 0	0 0.04 0.04 0.04 0 0 0 8 Std I 98 0.05: 74 0.09(3	Err 95 056 155	0 0.08944 0.08944 0 0 0 Std Dev 0.133 0.2025	0.0% 9.32% 15.97% 223.6% CV% 11.55% 14.91%	4.0% 44.0% 96.0% 100.0%
	6d 22h 08-4869-1228 12 Aug-14 14:59 NA Jimmary Endpoint 7d Survival Rate Mean Dry Bioma Summary Endpoint 7d Survival Rate Mean Dry Bioma	6d 22h So 08-4869-1228 Co 12 Aug-14 14:59 Ma So: NA Sta ummary Endpoint 7d Survival Rate Mean Dry Biomass-mg Summary Endpoint 7d Survival Rate	Source	Source	Source	Source: Aquatic Biosystems, CO	Source	Age	Source Aquatic Biosystems, CO Age	Source Aquatic Biosystems, CO Age	Source Aquatic Biosystems, CO Age

CETIS Summary Report

Report Date:

03 Sep-14 15:15 (p 2 of 2)

Test Code:

TOPS081214 | 18-1465-5774

	Pacific	Topsmelt 7-d	Survival and	Growth Test
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Aquatic Bioassay & Consulting Labs, Inc.

7d Surviva	ni Rate Detail						
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Negative Control	1	1	1	1	1	
56		0.8	1	1	1	1	
100		0.6	0.6	0.4	0.6	0.6	
180		0.2	0	0	0	0	
320		0	0	0	0	0	
560		0	0	0	0	0	

Mean Dry Biomass-mg Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.036	1.21	1.228	0.988	1.298
56		1.442	1.158	1.49	1.574	1.128
100		0.834	0.878	0.928	0.678	0.98
180		0.21	0	0	0	0
320		0	0	0	0	0
560		0	0	0	0	0

7d Survival Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Negative Control	5/5	5/5	5/5	5/5	5/5	
56		4/5	5/5	5/5	5/5	5/5	
100		3/5	3/5	2/5	3/5	3/5	9
180		1/5	0/5	0/5	0/5	0/5	1
320		0/5	0/5	0/5	0/5	0/5	
560		0/5	0/5	0/5	0/5	0/5	•

Report Date:

03 Sep-14 15:15 (p 1 of 4)

Test Code:

TOPS081214 | 18-1465-5774

Pacific Topsmeit 7-a Survival and Growth Test	t
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Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: 09-5324-5788 Endpoint: 7d Survival Rate CETIS Version: CETISv1.8.7 Analyzed: 03 Sep-14 15:15 Analysis: Parametric-Control vs Treatments Official Results: Yes

Sample ID: 08-4869-1228 Code: TOPS081214 Client: ABC Labs Sample Date: 12 Aug-14 14:59 Material: Copper chloride Project: **REF TOX**

Receive Date: Source: Reference Toxicant Sample Age: NA **REF TOX**

Station:

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	11.7%	56	100	74.83	

Dunnett Multiple Comparison Test

Control vs	C-μg/L	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(a:5%)
Negative Control	56	0.8583	2.227	0.124	8	0.3889	CDF	Non-Significant Effect
	100*	9.001	2.227	0.124	8	<0.0001	CDF	Significant Effect
	180*	19.32	2.227	0.124	8	<0.0001	CDF	Significant Effect
			,		•			

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(a:5%)
Between	3.728729	1.24291	3	161.5	<0.0001	Significant Effect
Error	0.1231686	0.00769804	16			-
Total	3.851897		19			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(a:1%)
Variances	Mod Levene Equality of Variance	0.3392	5.953	0.7974	Equal Variances
Variances	Levene Equality of Variance	2.412	5.292	0.1047	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.8744	0.866	0.0140	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.2271	0.2235	0.0081	Non-normal Distribution
Distribution	D'Agostino Skewness	0.8969	2.576	0.3698	Normal Distribution
Distribution	D'Agostino Kurtosis	1.842	2.576	0.0654	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	4.199	9.21	0.1225	Normal Distribution
Distribution	Anderson-Darling A2 Normality	1.292	3.878	0.0019	Non-normal Distribution

7d Survival Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	1	0	0.0%	0.0%
56		5	0.96	0.8489	1	1	8.0	1	0.04	9.32%	4.0%
100		5	0.56	0.4489	0.6711	0.6	0.4	0.6	0.04	15.97%	44.0%
180		5	0.04	0	0.1511	0	0	0.2	0.04	223.6%	96.0%
320		5	0	0	0	0	0	0	0		100.0%
560		5	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
56		5	1.298	1.165	1.43	1.345	1.107	1.345	0.04763	8.21%	3.54%
100		5	0.8458	0.734	0.9576	0.8861	0.6847	0.8861	0.04027	10.65%	37.13%
180		5	0.2731	0.1409	0.4054	0.2255	0.2255	0.4636	0.04763	38.99%	79.7%
320		5	0.2255	0.2255	0.2256	0.2255	0.2255	0.2255	0	0.0%	83.24%
560		5	0.2255	0.2255	0.2256	0.2255	0.2255	0.2255	0	0.0%	83.24%

Report Date:

03 Sep-14 15:15 (p 2 of 4)

Test Code:

TOPS081214 | 18-1465-5774

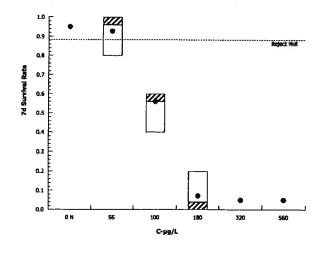
							Test Code:	10P3081214 18-1465-5//4
Pacific Tops	melt 7-d Survival	and G	rowth Test				Aquatic Bi	oassay & Consulting Labs, Inc.
Analysis ID:	09-5324-5788		Endpoint:	7d Survival R	ate		CETIS Version:	CETISv1.8.7
Analyzed:	03 Sep-14 15:1	5	Analysis:	Parametric-C	ontrol vs Tre	eatments	Official Results:	Yes
7d Survival F	Rate Detail							
C-µg/L	Control Type	Rep '	1 Rep 2	Rep 3	Rep 4	Rep 5		
0	Negative Control	1	1	1	1	1	-	
56		8.0	1	1	1	1		
100		0.6	0.6	0.4	0.6	0.6		
180		0.2	0	0	0	0		
320		0	0	0	0	0		
560		0	0	0	0	0		
Angular (Cor	rected) Transforn	ned De	etail					
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		

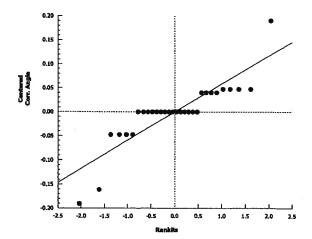
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Negative Control	1.345	1.345	1.345	1.345	1.345	
56		1.107	1.345	1.345	1.345	1.345	
100		0.8861	0.8861	0.6847	0.8861	0.8861	
180		0.4636	0.2255	0.2255	0.2255	0.2255	
320		0.2255	0.2255	0.2255	0.2255	0.2255	
560		0.2255	0.2255	0.2255	0.2255	0.2255	

7d Survival Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	2	Rep 3	Rep 4	Rep 5	
0	Negative Control	5/5	5/5	Ţ.	5/5	5/5	5/5	
56		4/5	5/5	;	5/5	5/5	5/5	
100		3/5	3/5	P	2/5	3/5	3/5	
180		1/5	0/5		0/5	0/5	0/5	
320		0/5	0/5		0/5	0/5	0/5	
560		0/5	0/5	6) E	0/5	0/5	0/5	

Graphics





Analyst:_____ QA:_

Report Date:

03 Sep-14 15:15 (p 3 of 4)

Test Code:

TOPS081214 | 18-1465-5774

Pacific Topsn	nelt 7	d Survival	and Gro	wth Test						Aquatic	Bioassay &	Consulting	Labs, Inc
Analysis ID:		593-3685		-	Mean Dry Bio	_				S Version		.8.7	8
Analyzed:	-	Sep-14 15:15			Parametric-C		reat	tments	Offic	ial Result	s: Yes		
Sample ID:		869-1228			TOPS081214				Clie		C Labs		
Sample Date:		ug-14 14:59			Copper chlor				Proj	ect: RE	F TOX		
Receive Date:					Reference To	oxicant							
Sample Age:	NA		St	tation: I	REF TOX								
Data Transfor		·	Zeta	Alt Hy	p Trials	Seed			PMSD	NOEL	LOEL	TOEL	TU
Untransformed	İ		NA	C>T	NA .	NA			17.4%	56	100	74.83	
Dunnett Multi	ple C	omparison `	Test					-					
Control	vs	C-µg/L		Test St	at Critical	MSD	DF	P-Value	P-Type	Decision	n(α:5%)		
Negative Conti	rol	56		-2.296	2.227	0.200	8	0.9987	CDF	Non-Sigr	nificant Effect		*
		100*		3.253	2,227	0.200	8	0.0066	CDF	Significa	nt Effect		
_		180*		12.35	2.227	0.200	8	<0.0001	CDF	Significa	nt Effect		
ANOVA Table						_							
Source		Sum Squar	'8 8	Mean S	Square	DF		F Stat	P-Value	Decision	n(α:5%)		
Between		5.012974		1.6709	91	3		82.7	<0.0001	Significa	nt Effect		
Error		0.3232704		0.02020	044	16				_			
Total		5.336244				19							
Distributional	Tests	3								ı		·	
Attribute		Test			Test Sta	at Critic	al	P-Value	Decision	(a:1%)			
Variances		Bartlett Equ	uality of '	Variance	2.436	11.34		0.4870	Equal Val	iances			
Variances		Mod Leven	e Equali	ty of Variar	nce 1.396	5.953		0.2916	Equal Val	iances			
Variances		Levene Eq	uality of	Variance	3.117	5.292		0.0555	Equal Var	riances			
Distribution		Shapiro-Wi	iik W No	rmality	0.9574	0.866		0.4928	Normal D	istribution			
Distribution		Kolmogoro	v-Smirno	ov D	0.1237	0.223	5	0.6086	Normal D	istribution			
Distribution		D'Agostino	Skewne	SS	0.4957	2.576		0.6201	Normal D	istribution			
Distribution		D'Agostino	Kurtosis	3	1.109	2.576		0.2675	Normal D	istribution			
Distribution		D'Agostino	-Pearsor	n K2 Omnit	ous 1.475	9.21		0.4783	Normal D	istribution			
Distribution		Anderson-D	Darling A	2 Normalit	y 0.3696	3.878		0.4308	Normal D	istribution			
Mean Dry Bior	mass-	mg Summa	ry										
<u> </u>			Count	Mean	95% LC	L 95% Լ	ICL	Median	Min	Max	Std Err	CV%	%Effect
	Nega	tive Control		1.152	0.9868	1.317		1.21	0.988	1.298	0.0595	11.55%	0.0%
56			5	1.358	1.107	1.61		1.442	1.128	1.574	0.09056	14.91%	-17.92%
100			5	0.8596	0.7165	1.003		0.878	0.678	0.98	0.05155	13.41%	25.38%
180			5	0.042	-0.07461	1 0.1580	3	0	0	0.21	0.042	223.6%	96.35%
320			5	0	0	0		0	0	0	0		100.0%
560			5	0	0	0		0	0	0	0		100.0%

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Negative Control	1.036	1.21	1.228	0.988	1.298	
56		1.442	1.158	1.49	1.574	1.128	
100		0.834	0.878	0.928	0.678	0.98	
180		0.21	0	0	0	0	
320		0	0	0	0	0	
560		0	0	0	0	0	

Mean Dry Blomass-mg Detail

Report Date:

03 Sep-14 15:15 (p 4 of 4)

Test Code:

TOPS081214 | 18-1465-5774

Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

14-4593-3685 03 Sep-14 15:15

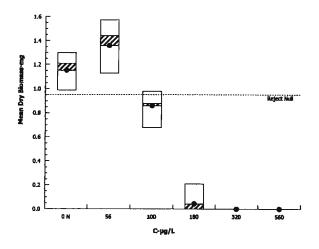
Endpoint: Mean Dry Biomass-mg Analysis:

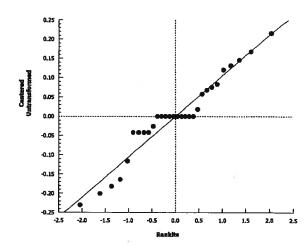
Parametric-Control vs Treatments

CETIS Version: Official Results: Yes

CETISv1.8.7

Graphics





Report Date:

03 Sep-14 15:15 (p 1 of 3)

Test Code:

TOPS081214 | 18-1465-5774

							Test Code):	TOPS081214 18-1465-	5774
Pacific	Topsm	neit 7-d Survival	and Growth Test				Aqu	ıatic Bi	oassay & Consulting Labs,	Inc.
Analys	is ID:	07-2625-8159	Endpoint:	7d Survival Ra	ite		CETIS Ver	rsion:	CETISv1.8.7	
Analyz		03 Sep-14 15:1	5 Analysis:	Linear Interpol	ation (ICPIN)		Official Re		Yes	
Sample	e ID:	08-4869-1228	Code:	TOPS081214	-		Client:	ABC	Labs	
Sample	e Date:	12 Aug-14 14:5	9 Material:	Copper chlorid	le		Project:	REF	TOX	
Receiv	e Date:	_	Source:	Reference Tox	cicant		-			
Sample	e Age:	NA	Station:	REF TOX						
Linear	interpo	lation Options								
X Trans	sform	Y Transform	Seed	Resamples	Exp 95% CL	Method				
Linear		Linear	0	280	Yes	Two-Point	Interpolation	n		
Point E	Stimate	28	Įį:	•	**					
Level	μg/L	95% LCL	95% UCL							
EC5	57.1	6.45	63.7	· · · · · · · · · · · · · · · · · · ·			· · ·			
EC10	62.6	38.7	69.2							
EC15	68.1	56.14	74.7							
EC20	73.6	63.7	80.2		*:					
EC25	79.1	69.95	85.7							
EC40	95.6	85.7	102.2							
EC50	109.2	92.63	118.5							
7d Sur	vival Ra	ite Summary	i		Calculated	i Variate(A/I	B)			
			3-22-		200					

7d Surviv	al Rate Summary		Calculated Variate(A/B)								
C-μg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	В
0	Negative Control	5	<u>a</u> 1	1	1	0	0	0.0%	0.0%	25	25
56		5	0.96	0.8	1	0.04	0.08944	9.32%	4.0%	24	25
100		5	0.56	0.4	0.6	0.04	0.08944	15.97%	44.0%	14	25
180		5	0.04	0	0.2	0.04	0.08944	223.6%	96.0%	1	25
320		5	0	0	0	0	0		100.0%	0	25
560		5	0	0	0	0	0		100.0%	0	25

C-µg/L **Control Type** Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 0 Negative Control 56 8.0 1 1 1 1 0.6 0.6 100 0.4 0.6 0.6 180 0.2 0 0 0 0

320 0 0 0 0 0 560 0 0 0 0

7d Surviva	il Rate Binomials					
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
56		4/5	5/5	5/5	5/5	5/5
100		3/5	3/5	2/5	3/5	3/5
180		1/5	0/5	0/5	0/5	0/5
320		0/5	0/5	0/5	0/5	0/5
560		0/5	0/5	0/5	0/5	0/5

7d Survival Rate Detail

Report Date:

03 Sep-14 15:15 (p 2 of 3)

Test Code:

TOPS081214 | 18-1465-5774

Pacific Topsmelt 7-d Survival and Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed:

07-2625-8159 03 Sep-14 15:15

Analysis: Linear Interpolation (ICPIN)

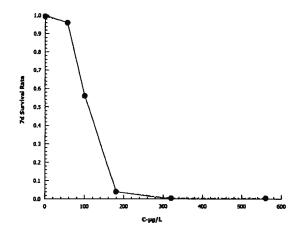
Endpoint: 7d Survival Rate

CETIS Version:

CETISv1.8.7

Official Results: Yes

Graphics



Report Date:

03 Sep-14 15:15 (p 3 of 3)

Test Code:

TOPS081214 | 18-1465-5774

Pacific Topsm	elt 7-d Survival and	Growth Test		Aquatic Bioassay & Consulting Labs, Inc.				
Analysis ID: Analyzed:	06-6398-2741 03 Sep-14 15:15	Endpoint: Analysis:	Mean Dry Biomass-mg Linear Interpolation (ICPIN)	CETIS Version: CETISv1.8.7 Official Results: Yes				
Sample ID:	08-4869-1228	Code:	TOPS081214	Client: ABC Labs				
Sample Date: Receive Date: Sample Age:	12 Aug-14 14:59	Material: Source: Station:	Copper chloride Reference Toxicant REF TOX	Project: REF TOX				

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	244042	280	Yes	Two-Point Interpolation

Point Estimates

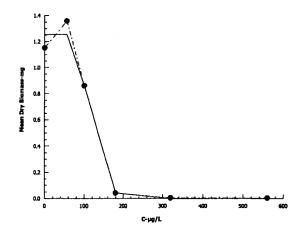
Level	µg/L	95% LCL	95% UCI
IC5	62.98	60.54	67.48
IC10	69.96	65.07	78.97
IC15	76.94	69.69	90.45
IC20	83.92	74.26	101.9
IC25	90.9	78.82	109.5
IC40	110.4	93.23	123.8
IC50	122.7	107.5	133.9

Mean Dry	Mean Dry Biomass-mg Sumn	nary									
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect		
0	Negative Control	5	1.152	0.988	1.298	0.0595	0.133	11.55%	0.0%		
56		5	1.358	1.128	1.574	0.09056	0.2025	14.91%	-17.92%	7	
100		5	0.8596	0.678	0.98	0.05155	0.1153	13.41%	25.38%		
180		5	0.042	0	0.21	0.042	0.09391	223.6%	96.35%		
320		5	0	0	0	0	0		100.0%		
560		5	0	0	0	0	0		100.0%		St 54

Mean Dry Biomass-mg Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.036	1.21	1.228	0.988	1.298
56		1.442	1.158	1.49	1.574	1.128
100		0.834	0.878	0.928	0.678	0.98
180		0.21	0	0	0	0
320		0	0	0	0	0
560		0	0	0	0	0

Graphics



Analyst: QA:

CETIS Measurement Report

Report Date:

03 Sep-14 15:15 (p 1 of 2)

Test Code:

TOPS081214 | 18-1465-5774

								eat Code.	101	0001217 1	0-1-00-0774
Pacific Tops	nelt 7-d Surviva	l and G	rowth Test					Aquati	: Bioassay &	Consulting	g Labs, Inc.
Batch ID: Start Date: Ending Date: Duration:	02-4919-6208 12 Aug-14 14:6 19 Aug-14 13:6 6d 22h		Test Type: Protocol: Species: Source:	Growth-Surviva EPA/600/R-95 Atherinops affi Aquatic Biosys	/136 (1995) nis		[[aboratory Sea ot Applicable	water	
Sample ID:	08-4869-1228		Code:	TOPS081214		·		Client: A	BC Labs		
• 1	12 Aug-14 14:	59	Material:	Copper chlorid	6				EF TOX		
Receive Date	-	,,	Source:	Reference Tox				10,001.	LITOX		
Sample Age:			Station:	REF TOX	ioan,						
Dissolved Ox		_									
C-µg/L	Control Type	Coun		95% LCL	95% UCL		Max	Std Err	Std Dev	CV%	QA Coun
0	Negative Contr		6.5	5.899	7.101	5.7	8.1	0.2542	0.7191	11.06%	0
56		8	6.3	5.918	6.682	5.6	7	0.1615	0.4567	7.25%	0
100		8	6.238	5.816	6.659	5.3	7	0.1782	0.5041	8.08%	0
180		8	6.275	5.979	6.571	5.7	6.8	0.125	0.3536	5.63%	0
320		5	6.32	5.703	6.937	5.7	7	0.2223	0.497	7.86%	0
560		2	6.4	3.859	8.941	6.2	6.6	0.2	0.2828	4.42%	0
Overall		39	6.339			5.3	8.1				0 (0%)
pH-Units											
C-µg/L	Control Type	Coun		95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Coun
0	Negative Contr		7.5	7.4	7.6	7.4	7.7	0.04226	0.1195	1.59%	0
56		8	7.525	7.428	7.622	7.4	7.7	0.04119	0.1165	1.55%	0
100		8	7.538	7.429	7.646	7.4	7.7	0.04608	0.1302	1.73%	0
180		8	7.55	7.45	7.65	7.4	7.7	0.04226	0.1195	1.58%	0
320		5	7.56	7.449	7.671	7.5	7.7	0.04	0.08944	1.18%	0 %
560		2	7.6	6.329	8.871	7.5	7.7	0.1	0.1414	1.86%	0
Overail		39	7.545			7.4	7.7			_	0 (0%)
Salinity-ppt		1000 1000									
C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Coun
0	Negative Contr	8	34	34	34	34	34	0	0	0.0%	0
56		8	34	34	34	34	34	0	0	0.0%	0
100		8	34	34	34	34	34	0	0	0.0%	0
180		8	34	34	34	34	34	0	0	0.0%	0
320		5	34	34	34	34	34	0	0	0.0%	0
560		2	34	34	34	34	34	0	0	0.0%	0
Overall		39	34			34	34				0 (0%)
Temperature-	°C										
C-µg/L	Control Type	Count		95% LCL			Max	Std Err	Std Dev	CV%	QA Coun
ס	Negative Contr		21	21	21	21	21	0	0	0.0%	0
56		8	21	21	21	21	21	0	0	0.0%	0
100		8	21	21	21	21	21	0	0	0.0%	0
180		8	21	21	21	21	21	0	0	0.0%	0
320		5	21	21	21	21	21	0	0	0.0%	0
560		2	21	21	21	21	21	0	0	0.0%	0

0 (0%)

21

Overall

Report Date:

Test Code:

03 Sep-14 15:15 (p 2 of 2) TOPS081214 | 18-1465-5774

							T	est Code:	TOPS081214 18-1465-5774
Pacific Top	smelt 7-d Surviva	l and Gr	owth Test					Aquati	c Bioassay & Consulting Labs, Inc.
Dissolved (Oxygen-mg/L								
C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	6.3	6.3	8.1	6.2	6.5	6.8	6.1	5.7
56		6.3	6	7	5.6	6.5	6.8	6.2	6
100		6.2	5.3	7	6	6.2	6.7	6.4	6.1
180		6.4	6.2	6.8	5.7	6.1	6.7	6.2	6.1
320		6.6	6.2	7	5.7	6.1			
560		6.6	6.2						
pH-Units									
C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.5	7.4	7.4	7.6	7.6	7.7	7.4	7.4
56		7.6	7.5	7.4	7.6	7.6	7.7	7.4	7.4
100		7.7	7.5	7.4	7.6	7.6	7.7	7.4	7.4
180		7.7	7.5	7.5	7.6	7.6	7.7	7.4	7.4
320		7.7	7.5	7.5	7.6	7.5			
560		7.7	7.5						
Salinity-ppt									
C-μg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	34	34	34	34	34	34	34	34
56		34	34	34	34	34	34	34	34
100		34	34	34	34	34	34	34	34
180		34	34	34	34	34	34	34	34
320		34	34	34	34	34			
560	=	34	34						
Temperatur	e-°C								
C-µg/L	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	21	21	21	21	21	21	21	21
56		21	21	21	21	21	21	21	21
100		21	21	21	21	21	21	21	21
180		21	21	21	21	21	21	21	21
320		21	21	21	21	21			
560		21	21						



CHRONIC ABALONE DEVELOPMENT BIOASSAY

DATE:

13 August 2014

STANDARD TOXICANT:

Zinc

NOEC =

32.00 ug/l

EC25 =

42.20 ug/l

EC50 =

52.41 ug/l

Yours very truly,

Scott Johnson

Laboratory Director

CETIS Summary Report

Report Date:

08 Sep-14 15:39 (p 1 of 1)

Test Code:

ABS081314 | 05-6394-4050

								lest Code:		485081314	05-6394-40
Red Abalone	Larval Developn	nent Test		86				Aquat	ic Bioassay	/ & Consul	ing Labs, In
Batch ID:	20-9249-7498	Test	Type:	Development				Analyst:	-		
Start Date:	13 Aug-14 12:0	0 Prote	ocol:	EPA/600/R-95/	136 (1995)			Diluent:	Laboratory S	Seawater	
Ending Date:	15 Aug-14 12:0	0 Spec	ies:	Haliotis rufesce	ns				Not Applicat		
Duration:	48h	Sour	ce:	Cultured Abalor	ne			Age:	••		
Sample ID:	12-4187-7498	Code) :	ABS081314				Client:	Internal Lab		
Sample Date:	13 Aug-14 12:00	0 Mate	rial:	Zinc				Project:	REF TOX		
Receive Date:	1	Sour	ce:	Reference Toxi	cant			•			
Sample Age:	NA	Stati	on:	REF TOX							
Comparison S	Summary		_								
Anaiysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Metho	od		
08-6554-3375	Proportion Norn	nal	32	56	42.33	20.0%		Steel	Many-One F	Rank Sum T	est
Point Estimat	e Summary										
Analysis ID	Endpoint		Level	μ g/ L	95% LCL	95% UCL	TU	Metho	od		
02-9141-9541	Proportion Norm	nal	EC5	34.04	32.98	39.02		Linear	Interpolation	n (ICPIN)	
			EC10	36.08	33.96	46.03					
			EC15	38.12	34.94	53.05					
			EC20	40.16	35.92	60.06					
			EC25	42.2	36.9	65.11					
			EC40	48.33	39.84	74.81					
			EC50	52.41	41.8	81.27					
Test Acceptat	oility					<u> </u>	_				
Analysis ID	Endpoint		Attrib	ute	Test Stat	TAC Limi	its _	Overl	ap Decis	ion	
02-9141-9541	Proportion Norm	nal	Contro	ol Resp	1	0.8 - NL		Yes	Passe	es Acceptab	ility Criteria
08-6554-3375	Proportion Norm	nal	Contro	ol Resp	1	0.8 - NL		Yes	Passe	s Acceptab	ility Criteria
08-6554-3375	Proportion Norm	nal	NOEL	=	32	NL - 56		No	Passe	es Acceptat	ility Criteria
08-6554-3375	Proportion Norm	nai	PMSE)	0.1996	NL - 0.2		No	Passe	es Acceptat	ility Criteria
Proportion No	ormal Summary										
	Control Type	Count	Mean	95% LCL		Min	Max			-	
	Negative Control		1	1	1	1	1	0	0	0.0%	
18		5	1	1	1	1	1	0	0	0.0%	
32		5	1	1	1	1	1	0	0	0.0%	
56		5	0.412	0	0.95	0	1	0.193		3 105.2	2% 58.8%
100		5	0	0	0	0	0	0	0		100.09
180		5	0	0	0	0	0	0	0		100.09
Proportion No											
<u> </u>	Control Type	Rep 1	Rep 2		Rep 4	Rep 5					
	Negative Control		1	1	1	1					
18		1	1	1	1	1					
32		1	1	1	1	1					
56		0.74	0.14	1	0.18	0					
100		0	0	0	0	0					
180		0	0	0	0	0					
Proportion No	ormal Binomials										
	Control Type	Rep 1	Rep 2		Rep 4	Rep 5					
)	Negative Control	100/100	100/1	00 100/100	100/100	100/100					
18		100/100	100/1	00 100/100	100/100	100/100					
32		100/100	100/1	00 100/100	100/100	100/100					
56		74/100	14/10		18/100	0/100				10	
100		0/100	0/100		0/100	0/100					
180		0/100	0/100	0/100	0/100	0/100					

Report Date:

08 Sep-14 15:39 (p 1 of 2)

Test Code:

ABS081314 | 05-6394-4050

									Test	Code:	ABSC	81314 05	-6394-405
Red Abalone	Larval	Developmo	ent Test							Aquatic	Bioassay & C	onsulting	Labs, Inc
Analysis ID:	08-6	554-3375	Enc	ipoint: P	Proportion Norm	nal			CETI	S Version	: CETISv1.	3.7	•
Analyzed:	08 S	ep-14 15:38	Ana	alysis: N	lonparametric-	Control v	's T	reatments	Offic	ial Result	s: Yes		
Sample ID:	12-4	187-7498	Cod	je: A	BS081314	-			Client: Internal Lab				
Sample Date:	: 13 A	ug-14 12:00	Mat	terial: Z	linc				Proje	ct: RE	F TOX		
Receive Date) :		Sou	ırce: R	Reference Toxic	cant							
Sample Age:	NA		Sta	tion: R	REF TOX								
Data Transfo	rm		Zeta	Alt Hyp	Trials	Seed			PMSD	NOEL	LOEL	TOEL	TU
Angular (Corn	ected)		NA	C > T	NA	NA			20.0%	32	56	42.33	
Steel Many-O	ne Rai	nk Sum Tes	it										
Control	VS	C-µg/L		Test Sta	at Critical	Ties	DF	P-Value	P-Type	Decision	n(a:5%)		
Negative Conf	trol	18		27.5	17	1	8	0.7500	Asymp	Non-Sigi	nificant Effect		
		32		27.5	17	1	8	0.7500	Asymp	Non-Sig	aificant Effect		
		56*		17.5	17	1	8	0.0470	Asymp	Significa	nt Effect		
ANOVA Table	B				-								3"
Source		Sum Squar	es	Mean S	quare	DF		F Stat	P-Value	Decision	n(a:5%)		
Between		2.615482		0.87182	75	3		10.13	0.0006	Significa	nt Effect		
Error		1.376565		0.08603	531	16							
Total		3.992047				19		-					
Distributiona	l Tests						1						
Attribute		Test			Test Stat	Critical	ŀ	P-Value	Decision	α:1%)			
		Mod Leven	e Equality	of Varian	ce 6.079	5.953		0.0093	Unequal \	/ariances			
Variances		1 F											
		Levene Equ	uality of V	ariance	17.79	5.292		<0.0001	Unequal \	/ariances			
Variances		Shapiro-Wi	•		17.79 0.6826	5.292 0.866	1	<0.0001 <0.0001	•	/ariances al Distribu	tion		
Variances Distribution		•	ilk W Norr	mality			1		Non-norm				
Variances Distribution Distribution		Shapiro-Wi	ilk W Norr v-Smirnov	mality / D	0.6826	0.866	1	<0.0001	Non-norm	al Distribu al Distribu			
Variances Distribution Distribution Distribution		Shapiro-Wi Kolmogoro	ilk W Norr v-Smirnov Skewnes	mality / D	0.6826 0. 4	0.866 0.2235	1 1	<0.0001 <0.0001	Non-norm Non-norm Normal D	al Distribu al Distribu	tion		
Variances Distribution Distribution Distribution Distribution		Shapiro-Wi Kolmogoro D'Agostino	ilk W Norr v-Smirnov Skewnes Kurtosis	mality / D s	0.6826 0.4 1.891 3.025	0.866 0.2235 2.576	1	<0.0001 <0.0001 0.0587	Non-norm Non-norm Normal D Non-norm	al Distribu al Distribu istribution	tion		
Variances Distribution Distribution Distribution Distribution Distribution		Shapiro-Wi Kolmogorov D'Agostino D'Agostino	ilk W Norr v-Smirnov Skewnes Kurtosis -Pearson	mality / D s K2 Omnib	0.6826 0.4 1.891 3.025 ous 12.73	0.866 0.2235 2.576 2.576	1	<0.0001 <0.0001 0.0587 0.0025	Non-norm Normal D Non-norm	al Distribu al Distribu istribution al Distribu	tion tion tion		
Variances Distribution Distribution Distribution Distribution Distribution Distribution Distribution	ormal (Shapiro-Wi Kolmogorov D'Agostino D'Agostino D'Agostino- Anderson-E	ilk W Norr v-Smirnov Skewnes Kurtosis -Pearson	mality / D s K2 Omnib	0.6826 0.4 1.891 3.025 ous 12.73	0.866 0.2235 2.576 2.576 9.21	1	<0.0001 <0.0001 0.0587 0.0025 0.0017	Non-norm Normal D Non-norm	al Distribu al Distribu istribution al Distribu al Distribu	tion tion tion		
Variances Distribution Distribution Distribution Distribution Distribution Distribution Distribution Distribution		Shapiro-Wi Kolmogorov D'Agostino D'Agostino D'Agostino- Anderson-E	ilk W Norr v-Smirnov Skewnes Kurtosis -Pearson	mality / D s K2 Omnib	0.6826 0.4 1.891 3.025 ous 12.73	0.866 0.2235 2.576 2.576 9.21	1	<0.0001 <0.0001 0.0587 0.0025 0.0017	Non-norm Non-norm Normal D Non-norm Non-norm	al Distribu al Distribu istribution al Distribu al Distribu	tion tion tion	CV%	%Effect
Variances Distribution Distribution Distribution Distribution Distribution Distribution Distribution Distribution Distribution Proportion No	Contr	Shapiro-Wi Kolmogorov D'Agostino D'Agostino D'Agostino- Anderson-E Summary of Type	ilk W Norr v-Smirnov Skewnes Kurtosis -Pearson Darling A2	mality D S K2 Omnib Normality Mean	0.6826 0.4 1.891 3.025 sus 12.73 7 3.725 95% LCL	0.866 0.2235 2.576 2.576 9.21 3.878	1	<0.0001 <0.0001 0.0587 0.0025 0.0017 <0.0001 Median	Non-norm Non-norm Normal D Non-norm Non-norm Min	al Distribu al Distribu istribution al Distribu al Distribu al Distribu Max	tion tion tion tion Std Err	0.0%	0.0%
Variances Distribution Distribution Distribution Distribution Distribution Distribution Distribution Proportion No C-µg/L	Contr	Shapiro-Wi Kolmogorov D'Agostino D'Agostino- D'Agostino- Anderson-E Summary of Type	ilk W Norr v-Smirnov Skewnes Kurtosis -Pearson Darling A2 Count 5	Mality K2 Omnib Normality Mean 1	0.6826 0.4 1.891 3.025 sus 12.73 7 3.725	0.866 0.2235 2.576 2.576 9.21 3.878 95% UC	1	<0.0001 <0.0001 0.0587 0.0025 0.0017 <0.0001	Non-norm Non-norm Normal D Non-norm Non-norm Min	al Distribu al Distribu istribution al Distribu al Distribu al Distribu Max	tion tion tion tion Std Err 0	0.0% 0.0%	0.0%
Variances Distribution Distribution Distribution Distribution Distribution Distribution Distribution Proportion No C-µg/L D	Contr	Shapiro-Wi Kolmogorov D'Agostino D'Agostino- D'Agostino- Anderson-E Summary of Type	ilk W Norroy-Smirnoy-Skewness Kurtosis-Pearson Darling A2 Count 5 5 5	Mality K2 Omnib Normality Mean 1 1 1	0.6826 0.4 1.891 3.025 sus 12.73 7 3.725 95% LCL 1 1	0.866 0.2235 2.576 2.576 9.21 3.878 95% UC	1	<0.0001 <0.0001 0.0587 0.0025 0.0017 <0.0001 Median 1 1	Non-norm Non-norm Normal D Non-norm Non-norm Min	al Distribu al Distribu istribution al Distribu al Distribu al Distribu Max 1 1 1	tion tion tion Std Err 0 0	0.0% 0.0% 0.0%	0.0% 0.0% 0.0%
Variances Variances Distribution Distribution Distribution Distribution Distribution Distribution Proportion No C-µg/L 0 18 32 56	Contr	Shapiro-Wi Kolmogorov D'Agostino D'Agostino- D'Agostino- Anderson-E Summary of Type	ilk W Norroy-Smirnoy-Skewness Kurtosis-Pearson Darling A2 Count 5 5 5 5	Mean 1 1 1 0.412	0.6826 0.4 1.891 3.025 sus 12.73 7 3.725 95% LCL 1	0.866 0.2235 2.576 2.576 9.21 3.878 95% UC 1 1 1 0.95	1	<0.0001 <0.0001 0.0587 0.0025 0.0017 <0.0001 Median 1	Non-norm Non-norm Normal D Non-norm Non-norm Min 1 1 1	al Distribu al Distribu istribution al Distribu al Distribu al Distribu Max 1	tion tion tion tion Std Err 0	0.0% 0.0%	0.0%
Variances Distribution Distribution Distribution Distribution Distribution Distribution Distribution Proportion No C-µg/L 0 18 32	Contr	Shapiro-Wi Kolmogorov D'Agostino D'Agostino- D'Agostino- Anderson-E Summary of Type	ilk W Norroy-Smirnoy-Skewness Kurtosis-Pearson Darling A2 Count 5 5 5	Mality K2 Omnib Normality Mean 1 1 1	0.6826 0.4 1.891 3.025 sus 12.73 7 3.725 95% LCL 1 1	0.866 0.2235 2.576 2.576 9.21 3.878 95% UC	1	<0.0001 <0.0001 0.0587 0.0025 0.0017 <0.0001 Median 1 1	Non-norm Non-norm Normal D Non-norm Non-norm Min	al Distribu al Distribu istribution al Distribu al Distribu al Distribu Max 1 1 1	tion tion tion Std Err 0 0	0.0% 0.0% 0.0%	0.0% 0.0%

95% LCL 95% UCL Median

1.521

1.521

1.521

0.4381

0.05002

0.05002

1.521

1.521

1.521

1.414

0.05003

0.05003

Min

1.521

1.521

1.521

0.05002

0.05002

0.05002

Max

1.521

1.521

1.521

1.521

0.05002

0.05002

Std Err

0.2624

0

0

0

0

0

CV%

0.0%

0.0%

0.0%

0.0%

0.0%

85.56%

%Effect

0.0%

0.0%

0.0%

54.92%

96.71%

96.71%

C-µg/L

0

18

32

56

100

180

Angular (Corrected) Transformed Summary

Count

5

5

5

5

5

5

Mean

1.521

1.521

1.521

0.6856

0.05002

0.05002

1.521

1.521

1.521

-0.04277

0.05001

0.05001

Control Type

Negative Contr

Report Date:

08 Sep-14 15:39 (p 2 of 2)

Test Code:

ABS081314 | 05-6394-4050

							1001 0040.	715000101110000014000
Red Abalone	Larval Developm	ent T	est		Aquatic Bloassay & Consulting Labs, Inc			
Analysis ID: Analyzed:	08-6554-3375 08 Sep-14 15:3	8	Endpoint: Analysis:	Proportion Normal Nonparametric-Control vs Treatments		CETIS Version: Official Results:	CETISv1.8.7 Yes	
Proportion N	lormal Detail			* ***				
C-µg/L	Control Type	Rep '	1 Rep 2	Rep 3	Rep 4	Rep 5		
0	Negative Control	1	1	1	1	1		
18		1	1	1	1	1		
32		1	1	1	1	1		
56		0.74	0.14	1	0.18	0		
100		0	0	0	0	0		
180		0	0	0	0	0		

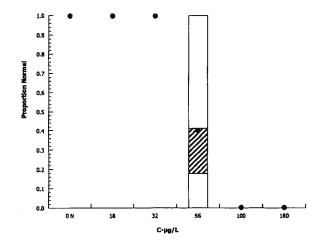
Angular (Corrected) Transformed Detail

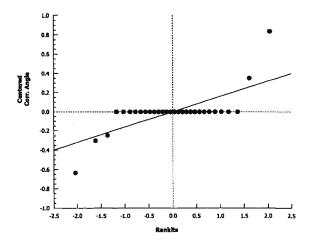
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.521	1.521	1.521	1.521	1.521
18		1.521	1.521	1.521	1.521	1.521
32		1.521	1.521	1.521	1.521	1.521
56		1.036	0.3835	1.521	0.4381	0.05002
100		0.05002	0.05002	0.05002	0.05002	0.05002
180		0.05002	0.05002	0.05002	0.05002	0.05002

Proportion Normal Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	Negative Control	100/100	100/100	100/100	100/100	100/100	
18		100/100	100/100	100/100	100/100	100/100	
32		100/100	100/100	100/100	100/100	100/100	
56		74/100	14/100	100/100	18/100	0/100	
100		0/100	0/100	0/100	0/100	0/100	1
180		0/100	0/100	0/100	0/100	0/100	

Graphics





Analyst:____QA:__

Report Date:

08 Sep-14 15:39 (p 1 of 2)

o Alia	іунсаі кері	OFL					1701	ort Date.	00	Och-14 1	io i d) ec.v
							Tes	t Code:	ABS	081314	05-6394-40
balone L	arval Developi	ment Tes	t e					Aquatic I	Bioassay &	Consultir	ng Labs, In
is ID:	02-9141-9541	E	ndpoint:	Proportion No	rmal		CE	IS Version:	CETISv1	.8.7	
ed:	08 Sep-14 15:3	38 A i	nalysis:	Linear Interpo	lation (ICPII	N)	Offi	cial Results	: Yes		
e ID:	12-4187-7498	C	ode:	ABS081314			Clie	ent: Inte	rnal Lab		
e Date:	13 Aug-14 12:0	00 M	aterial:	Zinc			Pro	ject: RE	F TOX		
e Date:		S	ource:	Reference To	xicant			-			
e Age:	NA	St	tation:	REF TOX							
Interpol	iation Options										
sform	Y Transform	n Se	eed	Resamples	Exp 95%	% CL Met	thod				
	Linear	0		280	Yes	Two	-Point Inter	polation			
Stimate	s		17.	. 20	<u> </u>						
μg/L	95% LCL	95% UC	:L								
34.04	32.98	39.02									
36.08	33.96	46.03									
38.12	34.94	53.05									
40.16	35.92	60.06									
42.2	36.9	65.11									
48.33	39.84	74.81									
52.41	41.8	81.27									
tion No	rmal Summary				Calc	ulated Vari	iate(A/B)				
Co	ontrol Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	Α	В
Ne	egative Control	5	1	1	1	0	0	0.0%	0.0%	500	500
		5	1	1	1	0	0	0.0%	0.0%	500	500
	9	5	1	1	1	0	0	0.0%	0.0%	500	500
	9	5	0.412	0	1	0.1938	0.4333	105.2%	58.8%	206	500
	13	5	0	0	0	0	0		100.0%	0	500
		5	0	0	0	0	0		100.0%	0	500
tion Nor	mal Detail		-					_			
C,	ontrol Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
C											
	palone L is ID: ed: e ID: e Date: e Date: e Age: Interpol sform Stilmate µg/L 34.04 36.08 38.12 40.16 42.2 48.33 52.41 tion No	palone Larval Developing is ID: 02-9141-9541 ed: 08 Sep-14 15:3 e ID: 12-4187-7498 e Date: 13 Aug-14 12:0 e Date: 9 Age: NA Interpolation Options sform Y Transform Linear Estimates	is ID: 02-9141-9541 E ed: 08 Sep-14 15:38 A is ID: 12-4187-7498 C is Date: 13 Aug-14 12:00 M e Date: S is Age: NA Si Interpolation Options Interpolation Opti	palone Larval Development Test is ID: 02-9141-9541	December December	Description Proportion Pr	Station Control Test Station Control Test Station Control Test Control Type Count Mean Min Max Std Err Negative Control Type Count Mean Min Max Std Err Count Control Type Count	Second Proportion Normal CET	Test Code: Aquatic I	Test Code: ABS	Aguatic Biolance Branch

0.18

Proportion	Normal	Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	100/100	100/100	100/100	100/100	100/100
18		100/100	100/100	100/100	100/100	100/100
32		100/100	100/100	100/100	100/100	100/100
56		74/100	14/100	100/100	18/100	0/100
100		0/100	0/100	0/100	0/100	0/100
180		0/100	0/100	0/100	0/100	0/100

0.14

0.74

Report Date:

08 Sep-14 15:39 (p 2 of 2)

Test Code:

ABS081314 | 05-6394-4050

Red Abalone Larval Development Test

Aquatic Bloassay & Consulting Labs, Inc.

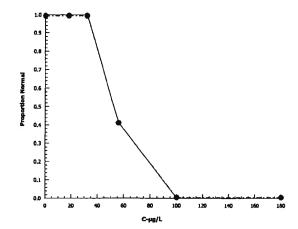
Analysis ID: Analyzed:

02-9141-9541 08 Sep-14 15:38 **Endpoint:** Proportion Normal

Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.7 Official Results: Yes

Graphics



CETIS Measurement Report

Report Date:

08 Sep-14 15:39 (p 1 of 2)

Test Code:

ABS081314 | 05-6394-4050

							16	est Code:	AD	3001314 1	JO-0394-4U5U
Red Abalone	Larval Develop	ment Te	est	-		-		Aqua	tic Bioassay &	Consultin	g Labs, Inc.
Batch ID: Start Date: Ending Date: Duration:	20-9249-7498 13 Aug-14 12: 15 Aug-14 12: 48h	00 00	Test Type: Protocol: Species: Source:	Development EPA/600/R-9 Haliotis rufes Cultured Aba	5/136 (1995) cens		Di Bi	nalyst: luent: rine: ge:	Laboratory Sea Not Applicable	water	
Receive Date:		00	Code: Material: Source:	ABS081314 Zinc Reference To	exicant			ient: oject:	Internal Lab REF TOX		
Sample Age:			Station:	REF TOX							
	ceptability Crite		h#1	Man As			0 1	B			
Parameter Callette			Min		ceptability	Limits	Overlap	Decision			
Salinity-ppt	20		34 14.3		- 36		Yes		Within Limits		
Temperature-°			14.3	T4.5 14	- 16		Yes	Results	Within Limits		
Dissolved Ox											
C-µg/L	Control Type	Count		95% LCL			Max	Std E		CV%	QA Count
0	Negative Contr		5.9	-2.994	14.79	5.2	6.6	0.7	0.9899	16.78%	0
18		2	6.95	6.315	7.585	6.9	7	0.05	0.07071	1.02%	0
32 56		2	6.95	6.315	7.585	6.9	7	0.05	0.07071	1.02%	0
		2	6.95	6.315	7.585	6.9	7	0.05	0.07071	1.02%	0
100 180		2 2	6.95	6.315	7.585	6.9	7	0.05	0.07071	1.02%	0
Overall		12	6.95 6.775	6.315	7.585	6.9 5.2	7	0.05	0.07071	1.02%	0 (0%)
pH-Units					- 1		<u>'</u>		-		0 (070)
C-µg/L	Control Type	Count	Mean	95% LCL	. 95% UCL	Min	Max	Std E	rr Std Dev	CV%	04.00
<u>Одиулс</u> 0	Negative Contr		7.4	7.389	7.411	7.4	7.4	0	0	0.0%	QA Count
18	regative conti	2	7.5	7.5	7.5	7.5	7.5	0	0	0.0%	0
32		2	7.5	7.5 7.5	7.5 7.5	7.5 7.5	7.5 7.5	0	0	0.0%	0
56		2	7.5	7.5 7.5	7.5	7.5	7.5 7.5	0	0	0.0%	0
100		2	7.5	7.5 7.5	7.5 7.5	7.5	7.5 7.5	0	0	0.0%	0
180		2	7.5	7.5	7.5	7.5	7.5 7.5	0	0	0.0%	0
Overali		12	7.483	- 1.0	7.0	7.4	7.5				0 (0%)
Salinity-ppt											5 (575)
,	Control Type	Count	Mean	95% LCL	. 95% UCL	Min	Max	Std E	rr Std Dev	CV%	QA Count
0	Negative Contr		34	34	34	34	34	0	0	0.0%	0
18	<u> </u>	2	34	34	34	34	34	ō	0	0.0%	Ö
32		2	34	34	34	34	34	0	0	0.0%	0
56		2	34	34	34	34	34	0	0	0.0%	0
100		2	34	34	34	34	34	0	0	0.0%	0
180		2	34	34	34	34	34	0	0	0.0%	0
Overall		12	34			34	34				0 (0%)
Temperature-	°C										
C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std E	rr Std Dev	CV%	QA Count
0	Negative Contr	2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
18		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
32		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
56		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
100		2	14.4	13.13	15.67	14.3	14.5	0.1	0.1414	0.98%	0
100 180		_	• • • •		10.07	17.0	17.5	U	0.1717	0.0070	•

CETIS Measurement Report

Report Date: Test Code: 08 Sep-14 15:39 (p 2 of 2)

CEII2 W	leasurement i	Report		Test Code:	ABS081314 05-6394-4050			
Red Abalo	ne Larvai Develop	ment Tes	t	Aquatic Bioassay & Consulting Labs, Inc				
Dissolved	Oxygen-mg/L							
C-µg/L	Control Type	1	2					
0	Negative Contr	6.6	5.2					
18		7	6.9					
32		7	6.9					
56		7	6.9					
100		7	6.9					
180		7	6.9					
pH-Units								
C-µg/L	Control Type	1	2					
0	Negative Contr	7.4	7.4					
18		7.5	7.5					
32		7.5	7.5					
56		7.5	7.5					
100		7.5	7.5					
180		7.5	7.5					
Salinity-pp	t			***				
C-µg/L	Control Type	1	2					
0	Negative Contr	34	34					
18		34	34					
32		34	34					
56		34	34					
100		34	34					
180		34	34					
Temperatu	re-°C							
C-µg/L	Control Type	1	2					
0	Negative Contr	14.5	14.3					
18		14.5	14.3					
32		14.5	14.3					
56		14.5	14.3					
100		14.5	14.3					

Analyst: QA:

180

14.5

14.3



CHRONIC KELP GERMINATION & GROWTH BIOASSAY

DATE:

13 August - 14

STANDARD TOXICANT:

Copper Chloride

ENDPOINT:

GERMINATION

NOEC =

100.00 ug/l

EC25 =

124.00 ug/l

EC50 =

148.20 ug/l

ENDPOINT:

GROWTH-LENGTH

NOEC =

100.00 ug/l

IC25 =

122.10 ug/l

IC50 =

146.60 ug/l

Yours very truly,

Scott Johnson

Laboratory Director

CETIS Summary Report

Report Date:

09 Sep-14 14:23 (p 1 of 2)

							Test Code:		KLP081314 10-6189-617
Macrocystis G	Sermination and Ge	rm Tube Grow	th Test				Aqua	tic B	ioassay & Consulting Labs, Inc.
Batch ID: Start Date: Ending Date: Duration:	05-7859-9980 13 Aug-14 14:00 15 Aug-14 14:00 48h	Test Type: Protocol: Species: Source:	Growth-Germ EPA/600/R-9 Macrocystis p David Gutoff	5/136 (1995)			Analyst: Diluent: Brine: Age:		oratory Seawater Applicable
Sample ID: Sample Date: Receive Date: Sample Age:		Code: Material: Source: Station:	KLP081314 Copper chlori Reference To REF TOX				Client: Project:	Inter	nal Lab
Comparison S	****								
Analysis ID	Endpoint	NOEL	. LOEL	TOEL	PMSD	TU	Meth	od	
01-5185-8980	Germination Rate	100	180	134.2	22.3%		Steel	Man	y-One Rank Sum Test
12-2672-2531	Mean Length	100	180	134.2	21.0%		Steel Many-One Rank Sum Test		
Point Estimate	Summary								
Analysis ID	Endpoint	Level	μg/L	95% LCL	95% UCL	TU	Meth	od	
18-2004-3903	Germination Rate	EC5	104.7	101.9	108.6		Linear Interpolation (ICPIN)		erpolation (ICPIN)
		EC10		105.9	118.8				
		EC15		109.5	129				
		EC20		113.2	139				
		EC25		116.8	149				
		EC40		127.8	179.2			ŧ.	
		EC50		135.1	202.1				
17-4183-9336	Mean Length	IC5	102.5	12.35	105.9		Linea	ar inte	erpolation (ICPIN)
		IC10	107.4	100.4	112.6				
		IC15	112.3	105.3	121.3				
		IC20	117.2	109.5	131.2		-		
		IC25	122.1	113.9	140.9				
		IC40	136.8	125.7	170.3				
		IC50	146.6	133.5	190.2				
Test Acceptab	•								
Analysis ID	Endpoint	Attrib		Test Stat		ts	Over	lap	Decision
01-5185-8980	Germination Rate		ol Resp	0.914	0.7 - NL		Yes		Passes Acceptability Criteria
18-2004-3903	Germination Rate		ol Resp	0.914	0.7 - NL		Yes		Passes Acceptability Criteria
2-2672-2531	Mean Length		ol Resp	16.16	10 - NL		Yes		Passes Acceptability Criteria
17-4183-9336	Mean Length	Contro	ol Resp	16.16	10 - NL		Yes		Passes Acceptability Criteria
40 0070 0504	Maran I amada	NOT		100					

100

0.223

0.2096

NL - 35

NL - 0.2

NL - 0.2

Νo

No

No

Above Acceptability Criteria

Above Acceptability Criteria

Above Acceptability Criteria

12-2672-2531 Mean Length

12-2672-2531 Mean Length

01-5185-8980 Germination Rate

NOEL

PMSD

PMSD

CETIS Summary Report

Report Date:

09 Sep-14 14:23 (p 2 of 2)

Test Code:

KLP081314 | 10-6189-6170

			*	_			Te	st Code:	KLP	081314 10	0-6189-617
Macrocysti	is Germination and	l Germ Tu	be Growth	Test			Aquatic Bioassay & Consulting Labs, Inc				
Germinatio	on Rate Summary						•				٠,
C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Contro	l 5	0.914	0.8883	0.9397	0.88	0.93	0.009274	0.02074	2.27%	0.0%
5.6		5	0.926	0.9052	0.9468	0.91	0.95	0.007483	0.01673	1.81%	-1.31%
10		5	0.918	0.8976	0.9384	0.9	0.94	0.007348	0.01643	1.79%	-0.44%
18		5	0.916	0.9049	0.9271	0.9	0.92	0.004	0.008944	0.98%	-0.22%
32		5	0.92	0.9004	0.9396	0.9	0.94	0.007071	0.01581	1.72%	-0.66%
100		5	0.92	0.8968	0.9432	0.9	0.95	0.008367	0.01871	2.03%	-0.66%
180		5	0.158	0	0.5967	0	0.79	0.158	0.3533	223.6%	82.71%
320		5	0	0	0	0	0	0	0		100.0%
Mean Leng	th Summary										
C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Contro	l 5	16.16	15.68	16.64	15.7	16.5	0.172	0.3847	2.38%	0.0%
5.6		5	15.72	14.83	16.61	14.8	16.7	0.32	0.7155	4.55%	2.72%
10		5	15.6	15.27	15.93	15.3	16	0.1183	0.2646	1.7%	3.47%
18		5	15.98	15.44	16.52	15.6	16.5	0.196	0.4382	2.74%	1.11%
32		5	15.76	15.19	16.33	15.2	16.4	0.204	0.4561	2.89%	2.48%
100		5	15.8	14.72	16.88	14.4	16.5	0.3899	0.8718	5.52%	2.23%
180		5	2.56	-4.548	9.668	0	12.8	2.56	5.724	223.6%	84.16%
320		5	0	0	0	0	0	0	0		100.0%
Germinatio	n Rate Detail		-								
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
)	Negative Control	0.92	0.93	0.88	0.93	0.91				-	
5.6		0.93	0.95	0.91	0.93	0.91					
10		0.94	0.9	0.91	0.93	0.91					
18		0.92	0.92	0.9	0.92	0.92					
32		0.93	0.91	0.92	0.94	0.9					
100		0.91	0.9	0.92	0.95	0.92					
180		0.79	0.5								
320		0.79	0	0	0 0	0					
Mean Lengt	th Detail										
_	Control Type	Rep 1	Pon 2	Pon 2	Bon 4	Den F					
C-µg/L	Negative Control		Rep 2 16.3	Rep 3 16.5	Rep 4 16.5	Rep 5 15.7		· · · · · · · · · · · · · · · · · · ·			_
5.6	Negative Control										
		15.5	15.5	16.7	16.1	14.8					
10		15.5	15.3	16	15.5	15.7					
18		15.8	16.5	16.4	15.6	15.6					
32		15.6	16.4	16	15.6	15.2					
100		16.3	16.5	14.4	15.5	16.3					
180		12.8	0	0	0	0					
320		0	0	0	0	0				2:	
Germinatio	n Rate Binomials										
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5					
)	Negative Control	92/100	93/100	88/100	93/100	91/100					
5.6		93/100	95/100	91/100	93/100	91/100					
10		94/100	90/100	91/100	93/100	91/100					
18		92/100	92/100	90/100	92/100	92/100					
32		93/100	91/100	92/100	94/100	90/100					
100		91/100	90/100	92/100	95/100	92/100					
80		79/100	0/100								
				0/100	0/100	0/100					
320		0/100	0/100	0/100	0/100	0/100					

Analyst: QA:

Report Date:

09 Sep-14 14:23 (p 1 of 4)

Test Code:

KLP081314 | 10-6189-6170

Macrocystis Gerr	nination and	Germ Tub	e Growth Test
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Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:

01-5185-8980

Endpoint: **Germination Rate** **CETIS Version:**

CETISv1.8.7

Analyzed:

09 Sep-14 14:23

Analysis: Nonparametric-Control vs Treatments Official Results: Yes

Sample ID:

20-2922-8578

Code:

KLP081314

Client:

Internal Lab

Sample Date: 13 Aug-14 14:00

Material:

Copper chioride Reference Toxicant Project:

Receive Date:

Sample Age: NA

Source: Station: **REF TOX**

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU	
Angular (Corrected)	NA	C>T	NA	NA	22.3%	100	180	134.2		

Steel Many-One Rank Sum Test

Control vs	C-µg/L	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(a:5%)
Negative Control	5.6	31	16	3	8	0.9749	Asymp	Non-Significant Effect
	10	28	16	3	8	0.8838	Asymp	Non-Significant Effect
	18	26	16	1	8	0.7547	Asymp	Non-Significant Effect
	32	29	16	4	8	0.9262	Asymp	Non-Significant Effect
	100	27.5	16	2	8	0.8571	Asymp	Non-Significant Effect
	180*	15	16	0	8	0.0222	Asymp	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.499707	0.7499512	6	23.43	<0.0001	Significant Effect
Error	0.896039	0.03200139	28			
Total	5.395746	,	34			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	72.69	16.81	<0.0001	Unequal Variances
Variances	Mod Levene Equality of Variance	0.8125	3.812	0.5721	Equal Variances
Variances	Levene Equality of Variance	6.068	3.528	0.0004	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.5071	0.9146	<0.0001	Non-normal Distribution
Distribution	Kolmogorov-Smirnov D	0.3282	0.1723	<0.0001	Non-normal Distribution
Distribution	D'Agostino Skewness	5.921	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino Kurtosis	5.144	2.576	< 0.0001	Non-normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	61.51	9.21	<0.0001	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	5.997	3.878	<0.0001	Non-normal Distribution

Germination Rate Summary

C-µg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	0.914	0.8883	0.9397	0.92	0.88	0.93	0.009273	2.27%	0.0%
5.6		5	0.926	0.9052	0.9468	0.93	0.91	0.95	0.007483	1.81%	-1.31%
10		5	0.918	0.8976	0.9384	0.91	0.9	0.94	0.007348	1.79%	-0.44%
18		5	0.916	0.9049	0.9271	0.92	0.9	0.92	0.004	0.98%	-0.22%
32		5	0.92	0.9004	0.9396	0.92	0.9	0.94	0.007071	1.72%	-0.66%
100		5	0.92	0.8968	0.9432	0.92	0.9	0.95	0.008366	2.03%	-0.66%
180		5	0.158	0	0.5967	0	0	0.79	0.158	223.6%	82.71%
320		5	0	0	0	0	0	0	0		100.0%

Angular (Corrected) Transformed Summary

C-μg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.275	1.23	1.319	1.284	1.217	1.303	0.01595	2.8%	0.0%
5.6		5	1.297	1.256	1.337	1.303	1.266	1.345	0.01468	2.53%	-1.73%
10		5	1.282	1.244	1.319	1.266	1.249	1.323	0.01368	2.39%	-0.54%
18		5	1.277	1.258	1.296	1.284	1.249	1.284	0.006999	1.23%	-0.19%
32		5	1.285	1.249	1.322	1.284	1.249	1.323	0.01312	2.28%	-0.82%
100		5	1.286	1.241	1.331	1.284	1.249	1.345	0.01625	2.83%	-0.87%
180		5	0.259	-0.3212	0.8391	0.05002	0.05002	1.095	0.2089	180.4%	79.68%
320		5	0.05002	0.05001	0.05003	0.05002	0.05002	0.05002	n	0.0%	96 08%

Report Date:

09 Sep-14 14:23 (p 2 of 4)

Test Code:

KLP081314 | 10-6189-6170

							rest code.	KLI 001314 10-0103-0170
Macrocystis	Germination and	Germ	Tube Grow	th Test			Aquatic Bi	oassay & Consulting Labs, Inc.
Analysis ID: Analyzed:	01-5185-8980 09 Sep-14 14:2		Endpoint: Analysis:	Germination R Nonparametric		Treatments	CETIS Version: Official Results:	CETISv1.8.7 Yes
Germination	Rate Detail							
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
0	Negative Control	0.92	0.93	0.88	0.93	0.91	***************************************	
5.6		0.93	0.95	0.91	0.93	0.91		
10		0.94	0.9	0.91	0.93	0.91		
18		0.92	0.92	0.9	0.92	0.92		
32		0.93	0.91	0.92	0.94	0.9		
100		0.91	0.9	0.92	0.95	0.92		
180		0.79	0	0	0	0		
320		0	0	0	0	0		
Angular (Cor	rected) Transform	ned De	tail	"		····	·····	
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
0	Negative Control	1.284	1.303	1.217	1.303	1,266		
5.6		1.303	1.345	1.266	1.303	1.266		
10		1.323	1.249	1.266	1.303	1.266		
18		1.284	1.284	1.249	1.284	1.284		
32		1.303	1.266	1.284	1.323	1.249		
100		1.266	1.249	1.284	1.345	1.284		
180		1.095	0.0500	0.05002	0.05002	0.05002	V.	
320		0.0500	0.0500	0.05002	0.05002	0.05002	#/ #/	
Germination	Rate Binomials						40	
C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5		
0	Negative Control	92/100	93/100	88/100	93/100	91/100		
5.6		93/100	95/100	91/100	93/100	91/100		
10		94/100	90/100	91/100	93/100	91/100	20	

Graphics

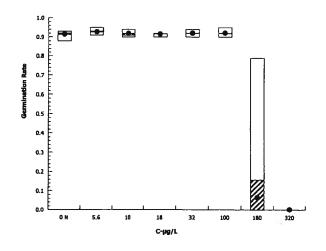
18

32

100

180

320



92/100

93/100

91/100

79/100

0/100

92/100

91/100

90/100

0/100

0/100

90/100

92/100

92/100

0/100

0/100

92/100

94/100

95/100

0/100

0/100

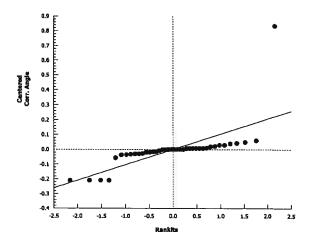
92/100

90/100

92/100

0/100

0/100



Analyst: QA:

Report Date:

09 Sep-14 14:23 (p 3 of 4)

Test Code:

KLP081314 | 10-6189-6170

Macrocystis Germination and Germ Tube Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:

12-2672-2531 09 Sep-14 14:23

Endpoint: Mean Length **CETIS Version:**

CETISv1.8.7

Analyzed:

Analysis: Nonparametric-Control vs Treatments

Official Results: Yes

Sample ID:

20-2922-8578

Code: KLP081314 Client:

Internal Lab

Sample Date: 13 Aug-14 14:00

Material:

Copper chloride

Project:

Receive Date:

Data Transform

Source:

Reference Toxicant

Trials

Sample Age: NA

Station: **REF TOX**

Alt Hyp

Untransformed	NA	C>T	NA	NA	
Steel Many-One Rank Sun	ı Test				

Zeta

PMSD NOEL LOEL **TOEL** TU 21.0% 100 180 134.2

Control vs	C-µg/L	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control	5.6	22	16	0	8	0.3786	Asymp	Non-Significant Effect
	10	17.5	16	1	8	0.0792	Asymp	Non-Significant Effect
	18	23.5	16	3	8	0.5252	Asymp	Non-Significant Effect
	32	20	16	0	8	0.2114	Asymp	Non-Significant Effect
	100	24	16	3	8	0.5746	Asymp	Non-Significant Effect
	180*	15	16	0	8	0.0222	Asymp	Significant Effect

Seed

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(a:5%)	
Between	756.452	126.0753	6	25.46	<0.0001	Significant Effect	
Error	138.632	4.951143	28				
Total	895.084		34				

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(a:1%)	
Variances	Bartlett Equality of Variance	60.05	16.81	<0.0001	Unequal Variances	
Variances	Mod Levene Equality of Variance	0.7287	3.812	0.6317	Equal Variances	
Variances	Levene Equality of Variance	5.618	3.528	0.0006	Unequal Variances	-
Distribution	Shapiro-Wilk W Normality	0.5609	0.9146	<0.0001	Non-normal Distribution	
Distribution	Kolmogorov-Smirnov D	0.3073	0.1723	< 0.0001	Non-normal Distribution	
Distribution	D'Agostino Skewness	5.785	2.576	< 0.0001	Non-normal Distribution	
Distribution	D'Agostino Kurtosis	5.06	2.576	<0.0001	Non-normal Distribution	
Distribution	D'Agostino-Pearson K2 Omnibus	59.06	9.21	< 0.0001	Non-normal Distribution	
Distribution	Anderson-Darling A2 Normality	4.801	3.878	<0.0001	Non-normal Distribution	

Mean Length Summary

C-μg/L	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	16.16	15.68	16.64	16.3	15.7	16.5	0.172	2.38%	0.0%
5.6		5	15.72	14.83	16.61	15.5	14.8	16.7	0.32	4.55%	2.72%
10		5	15.6	15.27	15.93	15.5	15.3	16	0.1183	1.7%	3.47%
18	29	5	15.98	15.44	16.52	15.8	15.6	16.5	0.196	2.74%	1.11%
32		5	15.76	15.19	16.33	15.6	15.2	16.4	0.204	2.89%	2.48%
100		5	15.8	14.72	16.88	16.3	14.4	16.5	0.3899	5.52%	2.23%
180		5	2.56	-4.548	9.668	0	0	12.8	2.56	223.6%	84.16%
320		5	0	0	0	0	0	0	0		100.0%

Mean Length Detail

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.8	16.3	16.5	16.5	15.7
5.6		15.5	15.5	16.7	16.1	14.8
10		15.5	15.3	16	15.5	15.7
18		15.8	16.5	16.4	15.6	15.6
32		15.6	16.4	16	15.6	15.2
100		16.3	16.5	14.4	15.5	16.3
180		12.8	0	0	0	0
320		0	0	0	0	0

Report Date:

09 Sep-14 14:23 (p 4 of 4)

Test Code:

KLP081314 | 10-6189-6170

Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID: Analyzed: 12-2672-2531 09 Sep-14 14:23 Endpoint: Analysis:

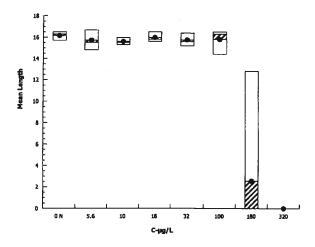
int: Mean Length

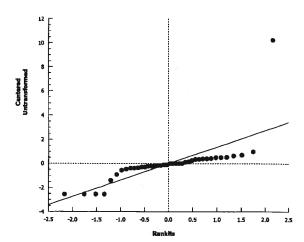
Nonparametric-Control vs Treatments

CETIS Version: Official Results:

CETISv1.8.7 Yes

Graphics





Report Date:

09 Sep-14 14:23 (p 1 of 4)

Test Code:

KLP081314 | 10-6189-6170

Macrocystis G	ermination and Ge	rm Tube Grow		Aquatic Bioassay & Consulting Labs, Inc			
Analysis ID: Analyzed:	18-2004-3903 09 Sep-14 14:23	Endpoint: Analysis:	Germination R Linear Interpol			CETIS Version: Official Results	*=**=*
Sample ID: Sample Date: Receive Date: Sample Age:	· ·	Code: Material: Source: Station:	KLP081314 Copper chloride Reference Toxicant REF TOX		Client: Internal Lab Project:		
Linear Interpo	lation Options						
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method		
Linear	Linear	0	280	Yes	Two-Point	Interpolation	
Point Estimate	98						

Level	μg/L	95% LCL	95% UCL
EC5	104.7	101.9	108.6
EC10	109.5	105.9	118.8
EC15	114.4	109.5	129
EC20	119.2	113.2	139

EC50	148.2	135.1	202.1
EC40	138.6	127.8	179.2
EC25	124	116.8	149
EC20	119.2	113.2	139
EC15	114.4	109.5	129

Germination Rate Summary			Calculated Variate(A/B)								
C-μg/L	g/L Control Type Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	В	
0	Negative Control	5	0.914	0.88	0.93	0.009273	0.02074	2.27%	0.0%	457	500
5.6		5	0.926	0.91	0.95	0.007483	0.01673	1.81%	-1.31%	463	500
10		5	0.918	0.9	0.94	0.007348	0.01643	1.79%	-0.44%	459	500
18		5	0.916	0.9	0.92	0.004	0.008944	0.98%	-0.22%	458	500
32		5	0.92	0.9	0.94	0.007071	0.01581	1.72%	-0.66%	460	500
100		5	0.92	0.9	0.95	0.008366	0.01871	2.03%	-0.66%	460	500
180		5	0.158	0	0.79	0.158	0.3533	223.6%	82.71%	79	500
320		5	0	0	0	0	0		100.0%	0	500

Ge	minat	ion Ra	te (Detail	
_		_			

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.92	0.93	0.88	0.93	0.91
5.6		0.93	0.95	0.91	0.93	0.91
10		0.94	0.9	0.91	0.93	0.91
18		0.92	0.92	0.9	0.92	0.92
32		0.93	0.91	0.92	0.94	0.9
100		0.91	0.9	0.92	0.95	0.92
180		0.79	0	0	0	0
320		0	0	0	0	0

Germination Rate Binomials

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	88/100	93/100	91/100
5.6		93/100	95/100	91/100	93/100	91/100
10		94/100	90/100	91/100	93/100	91/100
18		92/100	92/100	90/100	92/100	92/100
32		93/100	91/100	92/100	94/100	90/100
100		91/100	90/100	92/100	95/100	92/100
180		79/100	0/100	0/100	0/100	0/100
320		0/100	0/100	0/100	0/100	0/100

Report Date:

09 Sep-14 14:23 (p 2 of 4)

Test Code:

KLP081314 | 10-6189-6170

Macrocystis Germination and Germ Tube Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

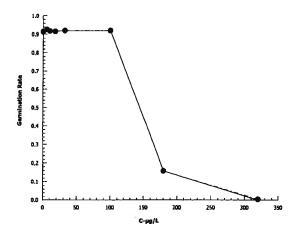
Analysis ID: Analyzed:

18-2004-3903 09 Sep-14 14:23 Endpoint: Germination Rate Analysis: Linear Interpolation (ICPIN) CETIS Version: Official Results: Yes

CETISv1.8.7

Graphics

000-055-186-3



Report Date:

09 Sep-14 14:23 (p 3 of 4) KLP081314 I 10-6189-6170

Test Code:

						Test Code:	KLP081314 10-6189-6170			
Macro	cystis G	iermination and	Germ Tube Grow	th Test		Aquatic B	Aquatic Bioassay & Consulting Labs, Inc.			
Analys	is ID:	17-4183-9336	Endpoint:	Mean Length		CETIS Version:	CETISv1.8.7			
Analyz	ed:	09 Sep-14 14:2	?3 Analysis:	Linear Interpo	lation (ICPIN)	Official Results:	Yes			
Sample	e ID:	20-2922-8578	Code:	KLP081314	<u> </u>	Client: Inter	nal Lab			
Sample	e Date:	13 Aug-14 14:0	0 Material:	Copper chloric	de	Project:				
Receive Date:		Source:	Reference To	xicant						
Sample	e Age:	NA	Station:	REF TOX						
Linear	Interpo	lation Options								
X Trans	sform	Y Transform	Seed	Resamples	Exp 95% CL	Method				
Linear		Linear	855619	280	Yes	Two-Point Interpolation				
Point E	stimate	es	-							
Level	μg/L	95% LCL	95% UCL							
IC5	102.5	12.35	105.9	=						
IC10	107.4	100.4	112.6							
IC15	112.3	105.3	121.3							
IC20	117.2	109.5	131.2							
IC25	122.1	113.9	140.9							
IC40	136.8	125.7	170.3				,			

Mean Ler	ngth Summary	Calculated Variate							
C-µg/L	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	16.16	15.7	16.5	0.172	0.3847	2.38%	0.0%
5.6		5	15.72	14.8	16.7	0.32	0.7155	4.55%	2.72%
10		5	15.6	15.3	16	0.1183	0.2646	1.7%	3.47%
18		5	15.98	15.6	16.5	0.196	0.4382	2.74%	1.11%
32		5	15.76	15.2	16.4	0.204	0.4561	2.89%	2.48%
100		5	15.8	14.4	16.5	0.3899	0.8718	5.52%	2.23%
180		5	2.56	0	12.8	2.56	5.724	223.6%	84.16%
320		5	0	0	0	0	0		100.0%

Mean Length Detail

IC50

146.6

133.5

190.2

C-µg/L	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.8	16.3	16.5	16.5	15.7
5.6		15.5	15.5	16.7	16.1	14.8
10		15.5	15.3	16	15.5	15.7
18		15.8	16.5	16.4	15.6	15.6
32		15.6	16.4	16	15.6	15.2
100		16.3	16.5	14.4	15.5	16.3
180		12.8	0	0	0	0
320		0	0	0	0	0

Report Date:

09 Sep-14 14:23 (p 4 of 4)

Test Code:

KLP081314 | 10-6189-6170

Macrocystis Germination and Germ Tube Growth Test

Aquatic Bioassay & Consulting Labs, Inc.

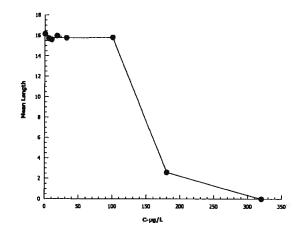
Analysis (D: Analyzed:

17-4183-9336 09 Sep-14 14:23 Endpoint: Mean Length

Analysis: Linear Interpolation (ICPIN)

CETIS Version: CETISv1.8.7 Official Results: Yes

Graphics



CETIS Measurement Report

Report Date:

09 Sep-14 14:23 (p 1 of 2)

Test Code:

KLP081314 | 10-6189-6170

							•	Test Code:	KL	P081314 1	0-6189-6170
Macrocystis (Germination an	d Germ	Tube Grow	th Test				Aquatic	Bioassay &	Consulting	Labs, Inc.
Batch ID: Start Date: Ending Date: Duration:	art Date: 13 Aug-14 14:00 Protocol: ding Date: 15 Aug-14 14:00 Species:			Growth-Germi EPA/600/R-95 Macrocystis py David Gutoff	7/136 (1995)			Analyst: Diluent: Laboratory Seawater Brine: Not Applicable Age:			4
Sample ID: Sample Date: Receive Date: Sample Age:	ample Date: 13 Aug-14 14:00 Material: Copper chloride seceive Date: Source: Reference Toxicant ample Age: NA Station: REF TOX						Client: Internal Lab Project:				
Dissolved Ox	ygen-mg/L		•	,							
C-µg/L	Control Type	Coun	t Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.4	1.318	11.48	6	6.8	0.4	0.5657	8.84%	0
5.6		2	6.15	5.515	6.785	6.1	6.2	0.05001	0.07072	1.15%	0
10		2	6.4	5.129	7.671	6.3	6.5	0.1	0.1414	2.21%	0
18		2	6.4	2.588	10.21	6.1	6.7	0.3	0.4243	6.63%	0
32		2	6.4	1.318	11.48	6	6.8	0.4	0.5657	8.84%	0
100		2	6.35	1.903	10.8	6	6.7	0.35	0.495	7.8%	0
180		2	6.4	0.0469	12.75	5.9	6.9	0.5	0.7071	11.05%	0
320		2	6.35	0.6322	12.07	5.9	6.8	0.45	0.6364	10.02%	0
Overall		16	6.356			5.9	6.9				0 (0%)
pH-Units					-					1	
C-µg/L	Control Type	Count	t Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
5.6		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
10		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
18		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
32		2	7.9	7.884	7.916	7.9	7.9	Ō	Ō	0.0%	0
100		2	7.9	7.884	7.916	7.9	7.9	Ō	0	0.0%	0
180		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
320		2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
Overali		16	7.9	7.007	7.010	7.9	7.9			0.078	0 (0%)
Salinity-ppt											0 (070)
	Control Type	Count	t Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
5.6	_	2	34	34	34	34	34	0	0	0.0%	0
10		2	34	34	34	34	34	0	0	0.0%	o o
18		2	34	34	34	34	34	0	0	0.0%	0
32		2	34	34	34	34	34	0	0	0.0%	0
100		2	34	34	34	34	34	0	0	0.0%	0
180		2	34	34	34	34	34	0	0	0.0%	0
320		2	34	34	34	34	34	0	0	0.0%	0
Overall		16	34	-		34	34			0.070	0 (0%)
Temperature-°	C			i	;						
· C-μg/L	Control Type	Count	. Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
	Negative Contr	2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
5.6		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
10		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
18		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
32		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
100		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
180		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
320		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075		
			194.73	17.11	19.38	17.7	14.0	0.00002	0.07075	0.48%	0

Analyst: QA:

0 (0%)

16

14.75

Overall

14.7

14.8

CETIS Measurement Report

Report Date: Test Code: 09 Sep-14 14:23 (p 2 of 2)

CE HO II	ncasulcilicili i	zebor		Test Code:	KLP081314 10-6189-6170		
Macrocys	tis Germination and	d Germ T	ube Growth Test	Aquatic Bioassay & Consulting I			
Dissolved	l Oxygen-mg/L						
C-µg/L	Control Type	1	2				
0	Negative Contr		6	-			
5.6	Ū	6.2	6.1				
10		6.5	6.3				
18		6.7	6.1				
32		6.8	6				
100		6.7	6				
180		6.9	5.9				
320		6.8	5.9				
pH-Units					······		
C-µg/L	Control Type	1	2				
0	Negative Contr	7.9	7.9		-		
5.6		7.9	7.9				
10		7.9	7.9				
18		7.9	7.9				
32		7.9	7.9				
100		7.9	7.9				
180		7.9	7.9				
320	21	7.9	7.9				
Salinity-pp	ot						
C-µg/L	Control Type	1	2				
0	Negative Contr	34	34				
5.6	9	34	34				
10		34	34				
18		34	34		~		
32	li	34	34				
100	39	34	34				
180		34	34				
320		34	34				
Temperatu	re-°C	_					
C-µg/L	Control Type	1	2				
0	Negative Contr	14.7	14.8				
56		14.7	14 A				

C-µg/L	Control Type	1	2
0	Negative Contr	14.7	14.8
5.6		14.7	14.8
10		14.7	14.8
18		14.7	14.8
32		14.7	14.8
100		14.7	14.8
180		14.7	14.8
320		14.7	14.8

Analyst: QA:



Prepared for: Freeport McMoRan O&G

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: August 14, 2014
Laboratory Number: 142038

Project Name: PF Hermosa Monthly NPDES Produced Water Monitoring

Sampled by: Client

On August 7, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION

CAS LAB NUMBER ID

NPDES PROD. WATER 142038-01 OCEAN WATER @-FIRE WATER PUMPS 142038-02

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa @ Orcutt

Mike Apple @-EDT

Ruth Juris @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 2 pages excluding the cover letter and the Chain of Custody.

This report shall not be reproduced except in full without the written approval of CAS. The test results reported represent only the item being tested and may not represent the entire material from which the sample was taken.



CERTIFICATE OF ANALYSIS

Client: Freeport McMoRan (PF Hermosa)

CAS LAB NO: 142038

Analyst: AN

Date Sampled: 08/06/14

Date Received: 08/07/14 Sample Matrix: Water

WET CHEMISTRY SUMMARY

COMPOUND RESULTS UNITS DF PQL MDL METHOD ANALYZED

CAS Lab#: 142038-01

Sample ID: NPDES Prod. Water

Dissolved Sulfide 150 mg/L 1 0.2 0.04 4500S⁻²F 08/14/14

CAS Lab#: 142038-02

Sample ID: Ocean Water @-Fire Water Pumps

Spec. Conductivity 51300 μ S/cm 1 1 --- 120.1 08/07/14

QUALITY CONTROL SECTION

Sample ID: Method CAS LAB NO: 1420		3		 		Analys	st: AN
		VET CHENI	STRY S	UNNARY			
CPMPOUND	RESULTS	UNITS	DF	PQL	MDL	METHOD	ANALYZED
ए इ. ११							
Dissolved Sulfide	ND	mg/L	1	0.2	0.04	4500S ⁻² F	08/14/14

DF: Dilution Factor

mg/L: Milligrams/Liter(ppm)

ND: Not Detected

LTS Environmental, Inc.		Rep	ort to:	FM O&G		Bill to: FM O&G 8/14
1	dirondack Avenue	Ĭ	c/o	LTS, 704 Adirondac	k Ave	700 Milam, Ste. 3100
Ven	ntura, CA 93003			Ventura, CA 93003		Houston, Tx 77002
	305-644-4560					SUSMITTED TO: Conce Applytical Society
FACILITY:		Hermosa	2	iù		SUBMITTED TO: Capco Analytical Services 0 /
COLLECTOR	<u></u>			25		REPORT TO: S.G. Lawry @ LTS PHONE: 644-4560
PROJECT/C	HARGE# Monthly	NPDES Prod	uced Water	Monitoring		COPIES TO: Platform Supervisor (201 S Broadway, Orcutt)
RESULTS R	EQUIRED: normal			-		Ruth Juris (email) PHONE:
RESULTS B	Y: PHONE:	FAX:		- 53 -		
,				5 ⁽⁹⁾		0
SAMPLE	SAMPLE ID	GRAB/	VOLUME	DATE/TIME	PRESERV.	ANALYSES REQUESTED (METHOD)
NO.		COMP.		COLLECTED		a a
1		grab	500 mL	8/6/2014	NaOH-Zn	Dissolved Sulfides (Method SM4500S-2F) MDL: 20 ug/L
	NPDES Prod.Wate		plastic	1648		(Dissolved sulfides were preserved & filtered in the field prior to submittal)
2	Ocean Water @	grab		8/6/2014	Ke	Conductivity
	Fire Water pumps			1715	~_	
			İ			
			.88		1	
				10		
**						Field notes:
				# - 4% (K		Field notes: 130 ppm field Sulfides
			9			19K Has
	ěl.					
Comments:						
	Diogga ranget ##	N 1 54	21			
vapco.	Please report M	PLS and PC	ALS on la	p report		
Relinquished I	by:	\rightarrow	Deter	0711	5.0	
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Received by:	~J.		Date: _ Time:		Relinquished	by: Date:
			THINE:		Received by:	Time:

Prepared for: Freeport McMoRan O&G

C/O: LTS environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: September 15, 2014

Laboratory Number: 142331

Project Name: PF Hermosa Monthly NPDES Produced Water Monitoring

Sampled by: Client

On September 11, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION

CAS LAB NUMBER ID

NPDES PROD. WATER 142331-01 OCEAN WATER @ FIRE WATER PUMPS 142331-02

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D.

Director - Analytical Operations

cc: PF Hermosa Supervisor @-Orcutt

Mike Apple @-EDT Ruth Juris @-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 2 pages excluding the cover letter and the Chain of Custody.

This report shall not be reproduced except in full without the written approval of CAS. The test results reported represent only the item being tested and may not represent the entire material from which the sample was taken.



CERTIFICATE OF ANALYSIS

Client: Freeport McMoRan (PF Hermosa)

Date Sampled: 09/08/14

CAS LAB NO: 142331

Date Received: 09/11/14

Analyst: AN

Sample Matrix: Water

WET CHEMISTRY SUMMARY

COMPOUND RESULTS UNITS DF PQL MDL METHOD ANALYZEI

CAS Lab#: 142331-01

Sample ID: NPDES Prod. Water

Dissolved Sulfide 125 mg/L 1 0.2 0.04 4500S⁻²F 09/12/14

CAS Lab#: 142331-02

Sample ID: Ocean Water @-Fire Water Pumps

Spec. Conductivity 51600 μ S/cm 1 1 --- 120.1 09/11/14

QUALITY CONTROL SECTION

Sample ID: Method CAS LAB NO: 14233						Analys	et: AN	
The special states and the special states are special states and the special states are special states and the special states are special states 		VET CHEMISTRY SUMMARY						
CPMPOUND	RESULTS		DF	PQL	MDL	METHOD	ANALYZED	
Dissolved Sulfide	ND	mg/L	1	0.2	0.04	4500S ⁻² F	09/12/14	

DF: Dilution Factor

mg/L: Milligrams/Liter(ppm)

ND: Not Detected

	nvironmental, Inc. dirondack Avenue	Repo	rt to: c/o	Freeport McMoRan C LTS, 704 Adirondack		Bill to: Freeport McMoRan O&G 700 Milam, Ste. 3100				
	itura, CA 93003	l .	WU	Ventura, CA 93003	AVE	Houston, Tx 77002				
	805-644-4560	·	**	VCITATA, OF COOCO	······································	17000011, 1777002				
FACILITY:	Platform H	l ermosa				SUBMITTED TO: Capco Analytical Services				
COLLECTOR		01111000			72	REPORT TO: S.G. Lawry @ LTS PHONE: 644-4560				
PROJECT/CI		PDES Produ	ced Water	Monitoring		COPIES TO: Platform Supervisor (201 S Broadway, Orcutt)				
RESULTS RE					8.	Ruth Juris (email) PHONE:				
RESULTS B	Y: PHONE:	FAX:	Fi.	_		9/18 9/19				
SAMPLE NO.	SAMPLE ID	GRAB/ COMP.	VOLUME	DATE/TIME COLLECTED	PRESERV.	ANALYSES REQUESTED (METHOD)				
1	NPDES Prod.Water	grab	500 mL plastic	9.3.14	NaOH-Zn	Dissolved Sulfides (Method SM4500S-2F) MDL: 20 ug/L (Dissolved sulfides were preserved & filtered in the field prior to submittal)				
2	Ocean Water @ Fire Water pumps	grab		9.9.14	/ce	Conductivity				
			500 70 - 30 - 30							
					<u> </u>					
8	10 X	\$P				19.5 k CHOS)				
		e) <u>9</u>	29 .			130 pm sulfides via field test				
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(6)	18			e nat na nat						
omments:		3		- A - A - A - A - A - A - A - A - A - A	9	3				
apco:	Please report MDL	s and PC	Ls on la	b report	Accessor					
(4)		7.								
elinquished l eceived by:	by:	<u></u>		9-11-14	Relinquished	by: Date: 09/1//				
to to to to to to to to to to to to to t	3MI, 38	100000000	Time:	845	Received by:	Time:				
elinquished l eceived by:	by:		Date: Time:		Relinquished Received by:	by: Date:				
ACDIVED NO										



Prepared for: Freeport-McMoRan Oil & Gas

C/O: LTS Environmental, Inc.

704 Adirondack Avenue Ventura, CA 93003 Attn: Steve Lawry

Report Date: October 14, 2014 Laboratory Number: 142567

Project Name: PF Hermosa Dissolved Sulfides

Sampled By: Client

On October 8, 2014, Capco Analytical Services, Inc.(CAS), received two(2) samples to be analyzed. The samples were identified and assigned the laboratory ID numbers listed below:

SAMPLE DESCRIPTION	CAS LAB NUMBER ID
V-97 NON-NPDES	142567-01
UNICEL OUT NPDES	142567-02

By my signature below, I certify that the results contained in this laboratory report comply with applicable standards for certification by the California Department of Public Health's Environmental Laboratories Accreditation Program (ELAP), both technically and for completeness, and that, based on my inquiry of the person or persons directly responsible for performing the analyses, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Keith Chin-Yuan Chang, Ph.D. Director - Analytical Operations

cc: PF Hermosa Supervisor

Mike Apple-EDT Ruth Juris-EDT

If you have any further questions or concerns, please contact me at your convenience. This report consists of 2 pages excluding the cover letter and the Chain of Custody.

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CERTIFICATE OF ANALYSIS

Client: Freeport-McMoRan Oil & Gas (PF Hermosa) Date Sampled: 10/07/14
CAS LAB NO: 142567 Date Received: 10/08/14
Analyzed By: AN Date Analyzed: 10/09/14

Sample Matrix: Water

DISSOLVED SULFIDE EPA METHOD 4500S⁻²F

CAS LAB #	Sample ID	RESULTS (mg/L)	DF	MDL (mg/L)	PQL (mg/L)
142567_02	Unicel Out NEDES	120	4	0.04	0.2
142567-02	Unicel Out NPDES	120	1	0.04	0.

QUALITY CONTROL DATA

142567-MB Method Blank ND 1 0.04 0.2

mg/L: Milligrams/Liter(ppm)

DF: Dilution Factor

Chain of Custody

704 A Ver	dirondack Avenue ntura, CA 93003	Report to FM O&G s c/o S. Lawry					Payable Ste 3100 (77002	
FACILITY: COLLECTOR: PROJECT/CH RESULTS RE	ARGE# nen-NPDEG s QUIRED: 48 hour/Hold	RH.				SUBMITTED TO REPORT TO: COPIES TO:	Platform Supervisor 201 S. Broadway, Orcutt, CA 93455	PHONE: 644-4560 PHONE:
RESULTS BY	SAMPLE ID/LOCATION	FAX:	VOLUME	DATE/TIME	Pre-		Ruth Juris ANALYSES REQUESTED	10/10 (METHOD)
NO. 1	V-97-non/NP 06	comp.	1	Date: 10/7/14 Time: 1700	NaOH Zn	Dissolved S	Sulfides	14256
2	Unicel out NPPES	grab	1	1705	Neght 2N	HOLD	Call LTS with results for	r#1 first.
			·					
21.0						Field flocula	Field notes	
						New Diffuser on line. 26 K. H2S. Need to order more reagent for the field		
						suifides tes		
Comments:	Run #1. Hold rest.							
Relinquished by:	yy: Clary		Date:	16.8-W	Relingula Received			Date:
Relinquished t	уу:		Date:		Relinquis	shed by:		Date:

Attachment 7

EPA Letter

Freeport-McMoRan Oil & Gas 201 S. Broadway Orcutt, CA 93455 Telephone: 805-934-8200

September 29, 2014

Mr. Eugene Bromley EPA Region IX, Water Division 75 Hawthorne Street San Francisco, CA 94105

Re: Hermosa Exceedance – Upset Condition

Dear Mr. Bromley:

This letter is in follow-up to a telephone message left for you on September 25, 2014 by Ruth Juris regarding an exceedance of the oil and grease limit for produced water discharges at Platform Hermosa. Ms. Juris reported this within 24 hours of receipt of a lab report on a produced water sample that was taken on September 18, 2014. The lab reported oil and grease results (method 1664) at 64 ppm.

It is believed that the well B-1 on Hermosa was the cause of the upset condition that resulted in this exceedance. Prior to the sampling, pressure swings and slightly elevated turbidity readings were noticed, which led operations to investigate the wells. At that time it was discovered that well B-1 was heading, causing erratic flow rates into the production separators that in-turn, caused a minor upset condition in the produced water treatment system. Operations were able to make adjustments to bring the well back under control and resolve the upset condition.

At no time did this situation present a hazard to human health or the environment.

Should you have any questions, please contact me at (805) 934-8220.

Sincerely,

Environmental, Health & Safety

Manager

Deline Rose